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FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last ordinary meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From Messrs. MACMILLAN AND Co.—Palæolithic Man in North-west Middlesex. By Jno. Allen Brown, F.G.S., &c.
From C. H. E. CARMICHAEL, Esq.—Report of the Royal Society of Literature, 1886.
From S. W. SILVER, Esq.—Catalogue of the York Gate Library, formed by Mr. S. W. Silver. By Edward Augustus Petherick.
From Dr. A. B. MEYER.—Publicationen aus den Königlichen Ethnographischen Museum zu Dresden. VI. Dr. M. Uhle. Holz- und Bambus-Geräthe aus Nord-West Neu Guinea (hauptsächlich gesammelt von A. B. Meyer) mit besonderer Berücksichtigung der Ornamentik. Mit 7 Tafeln, Lichtdruck.

VOL. XVII.

B

- From the AUTHOR.—Notes on the Evidence bearing upon British Ethnology. By T. V. Holmes, F.G.S., &c.
- Preliminary Note of an Analysis of the Mexican Codices and Graven Inscriptions. By Zelia Nuttall.
- Di alcune accette di pietra, specialmente di Giadaite, del R. Museo di Antichità in Parma. By Dr. A. B. Meyer.
- Intorno a quattro accette di pietra che si conservano nel museo civico di Rovereto. Memoria di A. B. Meyer.
- From the ACADEMY.—Atti della Reale Accademia dei Lincei. Serie Quarta. Rendiconti. Vol. II. Fas. 11.
- From the K.-K. AKADEMIE DER WISSENSCHAFTEN, WIEN.—Sitzungsberichte, philos.-histor. Classe. Band 110, Heft, 1, 2; Band 111, Heft 1, 2; Register, XI; Sitzungsberichte, math.-naturw. Classe. I Abthlg., 1885, Nos. 5, 6-7, 8, 9-10; 1886, No. 1-3. II Abthlg., 1885, No. 4-5, 6, 7, 8, 9, 10; 1886, No. 1-2. III Abthlg., 1885, No. 3-5, 6-7, 8-10; Almanach, 1886.
- From the ASSOCIATION.—Journal of the Royal Historical and Archæological Association of Ireland. No. 66.
- Journal of the East India Association. Vol. XIX. No. 1.
- From the CLUB.—Proceedings of the Berwickshire Naturalists' Club. 1885.
- From the SOCIÉTÉ ARCHÉOLOGIQUE, AGRAM.—Viestnik hrvatskoga Arkeologickoga Druztva. Godina IX. Br. 1.
- From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE.—Correspondenz-Blatt. 1886. Nos. 10, 11; Archiv für Anthropologie. Band XVI. Heft 4.
- From the SOCIETY.—Proceedings of the Royal Society. Nos. 248, 249.
- Proceedings of the Royal Geographical Society. 1887. February.
- Journal of the Society of Arts. Nos. 1782-1785.
- Journal of the Royal Asiatic Society. Vol. XVIII, Vol. XIX, Part 1.
- Proceedings of the Society of Biblical Archæology. Vol. VIII.
- Bulletin de la Société d'Anthropologie de Lyon. Tome IV. 1885.
- Bulletin des Procès-Verbaux de la Société d'Emulation d'Abbeville. 1885.
- From the EDITOR.—Nature. Nos. 898-901.
- Science. Nos. 204-207.
- American Antiquarian. Vol. IX. No. 1.
- Photographic Times. Nos. 276-280.
- Revue d'Anthropologie. 1887. No. 1.
- Revue d'Ethnographie. 1886. No. 4.
- L'Homme. Nos. 21-22.
- Bullettino di Paletnologia Italiana. Ser. II. Tom. II. Nos. 11, 12.

The following paper was read by the author :—

On the TRIBES of the NILE VALLEY, NORTH of KHARTÚM.

By SIR CHARLES W. WILSON, K.C.B., K.C.M.G., D.C.L., F.R.S.

[WITH PLATE I.]

IN offering the present paper to the Anthropological Institute, I must apologise for its incompleteness. I have attempted to throw some light on the tribal history and relations of the people who live in the Nile Valley north of Khartúm. The subject is one of great difficulty and obscurity from the almost entire absence of written records, and from the extraordinary way in which the races have in many cases been mixed up. It is curious, for instance, to see how completely the indigenous population has, in certain cases, lost its nationality whilst absorbing its Arab conquerors; and how Hamitic, Semitic, and Núba tribes alike claim descent from the Koreish of Mecca. My own observation was limited; I only came into personal contact with a few of the tribes; but I had to make enquiries about the others for the purposes of the Nile Expedition. These enquiries were naturally as to the political relations of the tribes, and this must account for the absence of scientific details in my paper. Active service is not favourable to scientific observation as regards ethnological questions; the disturbance of the population is too great, and the people are too excited, too frightened, and too interested to be natural. The only way to gain the confidence of natives is to live amongst them until they become accustomed to your ways, and cease to be frightened or shy. If natives once see that you know their habits, and understand and like them, you can get almost anything you like out of them. This is, perhaps, especially the case with Arabs, who are naturally great gossips, but who are at the same time extremely suspicious and believe that some ulterior motive must underlie any leading or abrupt question. As far as my observation went there is little to add to the account which Burckhardt gave of the Núba, though the country, owing to Egyptian misgovernment, has greatly changed for the worse since his visit.

The tribes of the Nile Valley north of Khartúm may conveniently be divided into three groups; the Hamitic, the Semitic, and the Núba. I propose, however, in the first place to say a few words on the Arab tribes north of Assúan, for they form as it were a group apart.

These Arabs may be called semi-nomads, for in nearly every case one portion of the tribe lives in houses or villages, whilst the other lives on the borders of the cultivated district; some of the

tribes, however, are pure nomads. They all own allegiance to the Egyptian Government, and as long as that Government is strong they are quiet and peaceful, but directly the central authority is weakened they begin raiding each other. I append a list of these tribes, which are all pure Arab, as far as I could ascertain their names:

El Amaiem	El Elekat	El Goheineh	El Nagameh
El Atawlah	El Endarab	El Harabi	El Rewah
El Attaiyat	El Fargan	El Howatah	El Saadnah
El Awazem	El Fowa'ed	El Kallabine	El Sabh
El Azaizah	El Fazarah	El Khoweiled	El Sa'alús
El Bar'asah	El Gahmah	El Máazi	El Tarshan
El Belí	El Galailat	El Marshakah	El Tarhúna
El Beni Wassal	El Gawabis	El Meteirat	El Tarabine
El Do'afa	El Gawazi	El Na'am	

35 Tribes.

Before entering into any details respecting the tribes above Assúan, it is advisable to note a few historical facts which have come down to us with more or less accuracy. During the Roman period we find above the first cataract two tribes or races, the Nobatæ and the Blemmyes, who undoubtedly represent the Núba and Bija of the present day. The Nobatæ appear to have been agricultural, the Blemmyes nomad and aggressive, and Diocletian is said to have settled colonies of the former on the Nile above Philæ, as a "buffer" between the Romans and the nomads. In 451, the two races combined in an attack on the Romans, but were badly defeated; and in 545, the Nobatæ were converted to Christianity, and their chief, Silko, who founded the Christian kingdom of Dongola, called himself "King of the Nobatæ, and of all the Ethiopians." In 20 or 21 A.H. (642): Amr (Amru) sent Ali Sarh, with 20,000 men, against the Núbas, but it was not till ten years later that he penetrated as far as Dongola, and "gave peace" from Assúan to Aloa¹ (which appears to be Sennár), imposing an annual tribute of 360 slaves on the Núba king, Koleydozo. An incident of the struggle was the attempted relief of a besieged Núba chief by a combined Núba and Bija force, in which there was a contingent from a giant race, called El Kowad, who wore copper rings in their lower lips, and had elephants.

In 216 A.H. (832), the Moslem Governor of Assúan entered into a treaty with the Bija chief, Kanún ibn Aziz, by which the latter engaged to protect the road to Aidhab on the Red Sea, appoint an agent for the tribe, and pay an annual tribute of 100 camels. This is the earliest record of a Government engagement with the northern section of the Bija, now the Ababdeh.

¹ Aloa may be a corruption of "*El Hô'i*," the island, the native name of the country between the two Niles.

In 255 A.H. (869), Abu Abderrahman, after a campaign against the Núba, passed eastwards to the mines in the Bija country with the Rabya, Jeheyneh, and other tribes, accompanied by 6,000 camels carrying food and water. The Rabya Arabs settled in the Bija country, married the daughters of the Bija chiefs, and became the tribal rulers; the Bija then supported the Rabya in their struggles with the Kahtan, Modher, and other Arab tribes. By 332 A.H. (943), the supremacy of the Rabya was complete; and the head chief, Beshír ibn Merwan ibn Ishak, of the Rabya, is said by Masúdí to have then had 3,000 Arab horsemen, and 30,000 Bija camel-men.

In 344 A.H. (956), the king of Núba commenced a succession of attacks on Assúan, but he was invariably defeated by the Arabs. In 1067 A.D., according to Leo Africanus, Iaiaia, son of Abubekr, entered Lower Ethiopia and Nubia and founded the kingdoms of Adel and Dangali (Dongola), but if this be correct the kingdoms could only have lasted for a brief period. In 674 A.H. (1276), Daúd, king of the Núbas, attacked Aidhab, and advancing northwards burned the "sakíahs" near Assúan; this was the beginning of the final struggle; the Moslems defeated Daúd, destroyed the churches, appointed his nephew, Shekendi, Governor of Lower Nubia, and made the people pay the exemption tax. A few years later Daúd rose again, and the final extinction of the Christian Kingdom of Dongola appears to have taken place before 1317 A.D., according to the inscription on a mosque at Old Dongola. Ibn Batuta says that the king of Dongola, who he calls Ibn Kenz Oddin, became a Moslem in the time of El Melik en Nasir, but it is not clear whether he means Salaeddin, 1171-1193, or Ibn Kalaún, who was reigning when he visited Egypt.¹ In 725 A.H. (1326), Ibn Batuta went up the Nile; he travelled from Siút to Edfú with Dughaim Arabs, then crossed the river, and started on his desert journey to Aidhab, with a Bija escort, from Adoane (El Edweh?). At this time the Bija appear to have been carrying on a war with the people of Barnau. In 815 A.H. (1412), the Howara Arab tribe attacked the Beni Kenz, a branch of the Rabya, then settled at Assúan, and drove them above the cataract; Macrizi mentions that they were called Barabra. In 1517, Sultan Selim conquered Egypt, and though we have no records that I know of, there is reason to believe that the advent of the Turks induced a further southward movement of the tribes. According to Burckhardt, the Gharbiyeh Arab tribe, being hard pressed by the Arab Jowabereh, asked Sultan Selim for assistance, and obtained from him several hundred Bosniac soldiers who drove the Jowabereh out of

¹ Perhaps the King of Dongola became a Moslem in 1321 A.D., when the edict forbidding Christians to ride horses, to wear a white turban, &c., was issued.

Nubia and settled between Assúan and Say; the descendants of these men, though quite black, still call themselves Osmanli. At a more recent period, as we know, the Turkish soldiers introduced into the country by Muhammad Ali frequently married and settled down amongst the natives.

The three races Arab, Bija, and Núba which inhabit this section of the Nile Valley, seem to have the same cluck with the tongue to deny or affirm; and they are equally superstitious, firmly believing in the efficacy of charms and amulets, and in lucky and unlucky days for commencing a journey or any of the ordinary pursuits and occupations of life. They have also, if I may so express it, the same strong religious instincts, and this has led to the formation of villages or settlements of "fekis," or fakirs, to which the men go for instruction. It is said that the enormous number of fakirs is due to their exemption from taxation, and the pleasures of an idle life, but I think it is really due to religious sentiment. The Fokara (fakirs or fekis) of the Súdán represent the learned class who can read and write; they are the letter readers and writers of the villages; write charms for lovers, and talismans for protection against harm and the evil eye, and they exorcise demons. It is this religious sentiment which has enabled the Khatimíyeh to extend their teaching so widely. The Khatimíyeh are one of the many Tarikahs or religious orders of Islam; and their head is known as the Sirr el Khatm, "Lord of perfection," or the man who has attained the highest degree of learning and piety. The Khatimíyeh are strict Sunnis and strongly opposed to all non-Koranic teaching; they play the same part in the Súdán as Senúsiism does amongst the Arabs of the country to the north and west. The object of the order is to strive after perfection in religion and to spread their tenets amongst the people; with this view mosques have been built and schools established in the villages; and nearly every young man I met who could read and write had been instructed by a member of the order. The first man to introduce the Khatimíyeh teaching in the Súdán was Muhammad Osman, an Arab of the Koreish tribe, and descendant of the Prophet; he had three sons, one of whom settled at Mecca; a second was Sidi Hassan, the father of Sidi Osman, of Kassala; and a third was Muhammad, the father of Sheikh El Merghani who lives at Cairo, and who rendered most valuable assistance to us at Sawákin. The influence of these men over many of the tribes is very great, and that influence has always been used in a most beneficial way.

Before closing this section of my paper I must briefly allude to the slave class. The number of slaves in the Súdán is enormous, and they constitute nearly one-half of the popula-

tion; they belong to a variety of tribes, speaking different languages, so that their only medium of communication is broken Arabic; and this appears to prevent any combination which might lead to a slave rebellion. They are not unkindly treated by their masters, but for every slave who reaches Dongola at least twelve have probably died on the road, and even many of those who survive the horrors of the long marches bear the marks of the cruelty of the slave hunters. The men are employed as domestic servants, agricultural laborers, soldiers, and as small craftsmen: the women as servants and prostitutes amongst the sedentary population; amongst the nomads the female slaves frequently become the wives of their masters.

I. *Hamitic.*

To the Hamitic group belong the Ababdeh, the Bisharín, and probably the Kabbabish; these tribes form part of the Great Bija or To-Bedawiet speaking race of which the Hadendoas, and Amarars of the Eastern Súdán are also members. Mr. Cameron has so recently read a paper on the Bija, near Sawákin, with special reference to the two last named tribes that I will only make a few general remarks.

In the middle ages the Bija tribes were powerful, and apparently consolidated under one leader. Ibn Batuta, early in the 14th century, mentions a king of Bija, named El Hadrabi, who received two-thirds of the revenue of Aidhab, the other one-third going to the king of Egypt. Their territory contained gold and emerald mines, and they escorted pilgrims from Kús to Aidhab, along the road then followed by pilgrims to Mecca. At the close of the 14th, or very early in the 15th, their rich town Zibid (Aidhab?) on the Red Sea was destroyed, according to Leo Africanus, by the Sultan, and this seems also to have destroyed their cohesion, for the Aidhab road was permanently closed about the same time. Early in the 16th century Sawákin was in the possession of the Turks to whom the "Troglodytæ" (Hadendoa?) paid tribute. Leo Africanus (1526) describes the Bija as "most base, miserable, and living only on milk and camels' flesh." Selim El Assúani says that they reckoned their lineage from the female side; that each clan had a chief, but that they had no sovereign and no religion; that the son by a sister or daughter succeeded, and that they had fine cows and camels; he adds, in words which might be used at the present day, "they are swift in running, by which they distinguish themselves from other people. Their camels are likewise swift and indefatigable, and patiently bear thirst; they outrun horses with them and fight on their backs, and turn them round with ease." Their country was always in commotion, and they were

a people ever prone to mischief. I have already alluded to the settlement of the Rabya, a tribe which entered Egypt with Amr, and took a leading part in the conquest, amongst the Bija, and similar settlements appear to have taken place amongst the eastern tribes by Arabs from Hadramaut, for Selim El Assúani states that the Hadhareb are the principal men of the nation. On the other hand, Ibn Batuta remarks that near the Red Sea coast the Bija had some Bedawi Arabs subject to them. The questions connected with the site of Aidhab, the position of the gold and emerald mines, and the old pilgrim road, though very interesting, hardly find a place here. Enough has been said to show the peculiar relations that have existed between the Arabs and the Bija, and to explain the origin of the Sheikh families, which constitute such a peculiar feature amongst the tribes.

The *Ababdeh* occupy a most important position, for they extend from the Nile at Assúan to the Red Sea, and reach northwards to the Keneh-Kosseir road, thus completely covering the south border of Egypt east of the Nile. They represent with some of the Bisharín clans, the Blemmyes of the classical geographers, and their *habitat* is little changed since the Roman period; they were in a constant state of warfare with the Romans, who at last adopted the policy of subsidizing them. In the middle ages they were known as Bija, and conveyed pilgrims from the Nile Valley to Aidhab, the port of embarkation for Jeddah. From time immemorial they have been guides of caravans through the Nubian Desert, and up the Nile Valley as far as Sennár; they intermarried with the Núba and settled down in small colonies at Shendi and elsewhere long before the Egyptian invasion. When the Súdán was conquered by Muhammad Ali, the Ababdeh rendered important services as guides, in supplying information, and in providing camels for transport; the Fogára clan in reward for its services was given the guardianship of the road across the Korosko Desert, and its chief, now represented by Hussein Pasha Khalífa, was made Khalífa; new Ababdeh settlements were also formed at Abu Ahmed and other places. They are still great trade carriers, and penetrate into the most distant districts; and as they are constantly meeting members of the various colonies of their tribe they have unusual sources of information and opportunities for intrigue. The Ababdeh as a rule speak Arabic, having from close contact with Egypt lost their own language, but the eastern portion of the tribe in many cases still speak To-Bedawiet; those sections nearest to the Nile have a large admixture of fellah blood. They claim an Arab origin,¹ ap-

¹ Burekhardt says they are descended from Selman, an Arab of the Beni Helal.

parently through their Sheikhs, and they have adopted Bedawi dress and habits, but they are not so warlike nor of such fine temperament as the true Arabs of Upper and Lower Egypt who look down upon them with feelings almost of contempt. They are lithe and well built but small; the average height is no more than five feet except in the Sheikh class who are evidently of Arab origin. The Ababdeh have the character of being faithless and being bound by no oath; they are notorious for duplicity rather than for courage; and are not to be trusted unless one of the nearest relations is left behind as a hostage. They were formerly poor, but have now become enriched by English gold, and probably the most wealthy of the tribes; this has not, however, secured their complete loyalty. The Ababdeh clans are: (1) The Ash Shebab, Sheikh Beshír Abu Jibrán, who appears to be a descendant of the Beshír Ibn Merwan of the Rabya, who first settled amongst the Bija; they live in the eastern part of the desert, and number about 3,000 camel men; (2) The Abúdyín, Sheikh Minshetta Karar, numbering 1,000 to 1,500 men; and (3) the Fogára, Hussein Pasha Khalífa, about 1,000 men. Sheikh Beshír is looked upon as the representative of the old line of Sheikhs, but the privileges granted to the Khalífa family by Muhammad Ali and his successors have rendered their clan the most wealthy and important.

The *Bisharín* occupy a position almost as important as that of the Ababdeh, for they stretch from the Nile, between the Atbara and Abu Ahmed, to the vicinity of Mount Elba on the Red Sea, and hold the western portion of the Sawákin-Berber road. They are nomads, and divided into several clans of which we have little definite information, but they are said to number about 20,000 men. They speak To-Bedawiet and are apparently of much purer blood than the Ababdeh. They are well-built, have good features, coarse, wiry, black hair dressed up in the Bija fashion, and the velvety skin of the Bija race; they are great trade carriers and celebrated for their breed of camels. The north-western clans are almost entirely dependent upon Egypt for their supply of wheat and other necessaries, which they obtain from Assúan; and they are allied to the Ababdeh of that district. They have never taken any very active part in the Súdán disturbances, and most of the clans remained neutral though much pressed by Osman Digna to join him. The known clans are:—

Shentirab.—On the east near the Red Sea.

Hamed Orab.—On the east near the Red Sea.

Aliab.—In the Korosko Desert south of the Ababdeh.

Amrab.—In the Korosko Desert south of the Ababdeh.

Eireiab	}	On the right bank of the Nile north of the Atbara.
Hamar		
Geihamab		
Nafiab		

Burckhardt also mentions the Hammadab, a handsome, bold race, much given to drinking, on the Atbara; and the Baterab, but I did not hear these names mentioned.

The *Kabbabish* tribe (Bruce derives the name from Hebsh Sheep) is perhaps the largest in the Súdán, and its various clans range over a wide extent of country west of the province of Dongola, and from the Nile to the confines of Darfúr. Their language is a pure Koranic Arabic, but their origin is not known; they have a tradition that they are of Mogrebin extraction, and that they were many generations ago driven from Tunis. They may thus perhaps be of Berber descent; but whilst the Sheikhs are apparently of Arab origin the men seem to be more nearly allied to the B́ja tribes than to the Arabs. There is a curious notice in Leo Africanus to the effect that the king of Nubia, whose capital was Dongola, was constantly at war with the people of the Desert of Goran, on the south (*i.e.*, Bayuda), who, being descended from the people called Zingani, spoke a language no one else understood. May not this reference be to the Kabbabish not then Arabicised. The view that the Kabbabish are not Arabs is supported by the fact that they say the Kawahleh, one of their clans, is not Kabbabish, but was affiliated to them many years ago. Kawahleh is a name of Arab formation, and Burckhardt in the early part of this century mentions them as a distinct tribe not so numerous but more powerful than the Shukriyeh and living about Abu Haraz and on the Atbara; the clan which is a very powerful one, took a distinct line of its own in favour of the Mahdi during the rebellion. It seems not unlikely that the Kabbabish received Arab rulers, like the Ababdeh, after their arrival in the Súdán; they own vast herds of camels, cattle and sheep, and before the war they used to have a monopoly of all the transport from the Nile, north of Abu Gússi to Kordofan. They are dark, with black, wiry hair, carefully arranged in tightly rolled curls which cling to the head, and rather thick aquiline noses. They have had little contact with civilisation, and the politics of the tribe were always difficult to understand. They are divided into two great branches each of which consists of several clans.

The Sheikh of the whole tribe is Sh. Saleh Fadlallah, who, before the war lived in great state; he has much slave blood and is nearly black. The section formerly under his immediate control consists of the following clans:—

Núrab, at Bir es Safi and Gabra; Sh. Saleh's own clan.
Welad Hauwelab, at Bir Ambalíli; Sh. Saleh Wad Obeid.
Serajab, at Bir Amri and Hajilij; Sh. Ahmed Wad Menallah.
Attawiyeh, at Bir Hobej.
Welad Suleiman, at Bir Es Safi and Bint Umm Bah.
Hauwarab, at Bir Gabra.
Umm Seraih, east of Bir Hobej.
Rawaheleh, at Bir Umm Sidr.
Rahuda, at Bir Es Safi.
Shenabla, near Obeid.
Kibeishab.
Kawahleh, Bir el Kejmar.
Aiwardieh, Ghalayau, Walad Ugbah, Hímrab, Ayayit, and
Dereywab.

The minor section under Sh. Salim Isáwi, is often called the Umm Meter tribe; many of the Sheikhs and others have houses on the Nile in the Dongola province, but the clans really live in the Kab Valley, an oasis running parallel to the Nile. The clans are, passing from south to north, the Bósh, Wamattú, Ghudayrab, Gungunnab, Dar Búshút, Murayssísab, Dar Hamid, Bulaylat, Awáyidah.

II. *Semitic.*

All the Arab speaking tribes of the Súdán speak a pure but archaic Arabic, such probably as they spoke when they left Arabia. They invariably pronounce the letter Kaf as "g" in good, and the Jim like "j" in jar, agreeing in this respect with the Syrian and Bedawi pronunciation, and not with the Egyptian. The Arabs distinguish themselves as Ahl Ibl, "people of the camel," who live as nomads in the desert, and have kept their blood pure; Ahl Sawáki, "people of the Sakieh," who have settled down as agriculturists, irrigating the ground, and have intermarried with the Núba; and Baggárah, or cattle breeders and owners. The purely nomad tribes on the south have to make annual migrations to avoid the fly (Johara) which appears during the rainy season; these migrations are nearly always attended by disturbances, but the Egyptians utilised them, as the Funniyeh kings did at an earlier date, to collect the taxes. Several of the tribes, as the Shagíah and Já'alín, have adopted the non-Semitic custom of gashing the cheeks, but the habit is not general. As a rule the head is shaved according to Arab custom, but the rule is very laxly observed by men of mixed descent; there is, however, no "hair-dressing" such as exists amongst the Hamitic tribes. The Arab arms are the lance, the two-edged sword, and a small knife fastened by a strap to the

left arm, and they do not carry a shield; they follow what appears to be the old Semitic custom of beheading a fallen enemy, but they never mutilate the bodies in the horrible manner that the Bija races (Hadendoa) do, nor do they maim prisoners in the way Osman Digna is said to have done.

One of the most interesting, and at the same time one of the most obscure questions in the Súdán is the extent to which the conquering Arabs established themselves amongst the indigenous tribes as over-lords or ruling families. In the case of the Bija (Ababdeh?) we have, as already noted, an historic record of an occurrence of the kind, and it seems probable that many other tribes accepted Arab rulers in a similar way. This would explain the claim of people such as the Mahass, who are clearly Núba, to be of Arab origin; and also the Semitic type, the higher intelligence, and often the greater stature of the Sheikh class. In some cases the Arab rulers appear to have intermarried with slaves rather than with the tribe they had joined, as in the case of Sheikh Saleh, of the Kabbabish, who is nearly black. The chiefs of settled clans are always termed Meliks, whilst those of the nomads are Sheikhs, a distinction that seems to be of very ancient date. The "Meliks" or kings of Palestine who were overthrown by Joshua, probably occupied positions analogous to those of the Súdán Meliks.

The nomad Arabs, especially the Baggárah, are as thoroughly Arab now as when they left their Asiatic home, and it may still be said of them that their hand is against everyone and everyone's hand against them. Before the Egyptian conquest the riverain population was armed and strong enough to resist the nomads, and in the south the Sennár Government maintained order with an army of blacks. During the Egyptian occupation the riverain population was weakened by misgovernment and over-taxation; the country was depopulated to a great extent, and the power of the Meliks taken from them. Order was kept by the Egyptian military forces, but these having now been withdrawn, or killed, the riverain population is entirely at the mercy of the nomads. That the latter have made use of their power we know from recent accounts, and the fact that Danaglas have been raided and sold as slaves in Egypt since the withdrawal of the British troops.

The Gararish, or Kararish, are semi-nomads, extending along the right bank of the Nile from Wady Halfa to Merawi: many of them are settled as agriculturists in Argo Island, and they are much employed as guides and in the transport of goods. They claim to be distantly connected with the Fogára clan of the Ababdehs; they are evidently of very mixed blood, but the Arab type is much stronger than the Bija, and they are pro-

bably of Arab origin. They number about 400 men and have two Sheikhs : Sh. Abdullah Wad Shemein and Sh. Suleiman.

The *Hawwawir* are pure nomads and extend along the desert road from Debbah to Khartúm as far as Bir Gamr, and from Ambigol to Wády Bishára. They claim to be, and evidently are, of pure Arab blood, and say that they are related to the Huweir of Egypt. They are not unlike the nomad Já'alín in appearance, and they have not adopted any of the African customs such as gashing the cheek, and dressing the hair; they are friends and allies of the Sowarab, number about 2,000 men, and have large herds of oxen, sheep, and many camels. The Sheikh is Khalíffa Taiyalla. The clans are :—

Fezarab, at Bir Gamr.

Mowalikeh, at Bir Bahat.

Hamasín, at Bir El Elai.

Umm Kereim, at Bir abu Osher.

Harrarín, at Bir Hassanauwi.

Umm Roba, at Bir Bayúda.

The *Shaglah* are, perhaps, the most interesting tribe in the Nile Valley; they are partly nomad, partly agricultural, and occupy the country on both banks of the Nile from Korti to the vicinity of Birtí, and a portion of the Bayúda desert. They claim descent from a certain Shayig Ibn Hamaidan, of the Beni Abbas, and maintain that they came over from Arabia at the time of the conquest, but whether they led the van of Arab invasion in the seventh century, or took part in the greater invasion and conquest in the fourteenth century, is uncertain. At Old Dongola there is an inscription to the effect that Safeddin Abdullah (who may have been a Shaglah chief) opened a mosque on the 1st June, 1317 A.D., in honour of his victory over the infidels. On reaching the district they now occupy the Shaglah dispossessed and largely intermarried with a people of Núba origin, whose language was Rotana; some of the places still retain their Rotana names; and in one part of the district there are families which have preserved their Núba blood in comparative purity. Like other Arab tribes they formerly owned allegiance to the Funniyeh kings of Sennár, but when the central authority became weak they threw off the yoke, and prior to the advent of the Memlúks in the Súdán had possessed themselves of the country northwards as far as Mahass. They were forced back by the Memlúks, but they have never forgotten that they once ruled Dongola; and the Danáglas still tell dismal stories of the sufferings they endured under their Arab taskmasters. Hence arose a blood feud which had a curious influence on several

incidents of the Súdán rebellion. When the Egyptians invaded the country in 1820 the Shagíah were under two "meliks" or "kinglets," Chaues and Zubeir, whose modern representatives are Saleh Bey Wad el Mek, and Khashm el Mús. At that period they were distinguished for their love of liberty, their courage, their skill as horsemen, their hospitality, their schools, in which all Moslem science was taught, and their great wealth in corn and cattle; their cavalry mounted on horses of the renowned Dongola breed were known and dreaded throughout the Súdán; their arms were the lance and sword; and the chiefs wore coats of mail and had shields of hippopotamus or crocodile skin, whilst the horsemen carried javelins which they threw. They offered a stubborn resistance to the Egyptians, but, once subdued, they joined the Egyptian army, and rendered important services in the further conquest of the country. For these services, and others connected with the suppression of the Já'alin revolt in 1822, they were granted lands on the right bank of the Nile, between Shendi and Khartúm, from which the Já'alin had been expelled. As the Egyptian power became consolidated these settlements increased in importance, and supplied recruits to the Shagíah battalions of Bashi Bazúks, of which the Egyptians maintained several; these battalions were commanded by Shagíah officers, many of whom grew wealthy and had country houses at Halfaya, near Khartúm. The military relationship was followed by a more intimate one, for the Turks took Shagíah wives, and the sons all entered the Bashi Bazúk force, and became the best fighting material in the Súdán from a Bashi Bazúk point of view.

The tribe is divided into twelve clans, and of these the Sowarab and a portion of the Aúniyah remained nomad, whilst the others became agricultural as they intermarried with the Núba. Their country, which is the ancient kingdom of Ethiopia, is the most fertile south of the Fayúm, and many of their villages are well built, with a proportion of fortified houses not unlike in shape the pylon of an Egyptian temple. The Shagíah speak Arabic, and, as a rule, preserve the Semitic type, but the large admixture of alien blood is very evident, and the Núba families amongst them, though thoroughly Arabicised, retain their Núba features. The nomads have to a great extent preserved their purity of blood, and observe many Arab customs lost to the riverain population. The latter section has sadly deteriorated through close intercourse with the Turk and Albanian Bashi Bazúks in the Egyptian service; of all people in the Súdán they are the most fickle, one day loyal, the next openly disloyal; one day as brave as lions, the next as timid as sheep; capable of acts of great self-sacrifice, and also of the

foulest treachery. Their actions seem to be governed by impulse, and it is impossible to say what a Shagíah will do under any given circumstances. General Gordon's first fight was to rescue a few Shagíah, shut up in a fort at Halfaya, who, to everyone's astonishment, remained loyal while their comrades went over to the enemy. Saleh Bey, the head of the whole tribe, surrendered at Fadassi, on the Blue Nile, with a steamer, boats, guns, and ample provisions, when he knew he was to be relieved in two or three days by Gordon; yet no sooner did he join the Mahdi than he refused to obey him, and was kept in chains throughout the siege. Khashm el Mús, on the other hand, remained loyal to the end under most trying circumstances. General Gordon says he "will back them to try a man's patience more sorely than any other people in the wide world, yea, and in the universe." The Shagíah are religious, and in no tribe has the teaching of Sidi Osman, of Kassala, which represents progress and civilisation as opposed to the stagnation and barbarism of Mahdiism, so many followers.

The Shagíah clans are:—

1. B'áúdab, at Birti. Melik, Muhammad Wad el Sadyk.
2. Omarab, at Amri. Melik, Walad Sôeyl.
3. Wad Umm Salim. Sub-clan Hamdab, at Hamdab. Melik, Wad et Tayib.
4. Kadangab, at Barkal and Karímah.
5. Nafiab, or Walad Amir, at Dúaim. Melik, Omar Soleyman.
6. Howeyshab, at Abu Dom Sanam. Melik, Saleh Samarit. Sub-clan Salahab.
7. Sowarab, the settled portion at Goreir and Hattáni, Sheikh, Muhammad Saleh; and at Wady Bishára, Sheikh Wad el Uzeirik. The nomad portion is divided into two principal sections, the Deisarab, Sheikh Muhammad Wad el Kheir, and the Fufunja, Sheikh Ali Baghít. The nomads number about 1,000 men, and stretch across the desert from Abdúm to Bir Gamr and Wady Bishára; they own large numbers of camels, cattle, and sheep, and before the war had charge, with the Hauwawír, of the Debbeh-Khartúm road.
8. Aúniah, partly settled at Korti and Wady Bishára; partly nomad in the desert between those places.
9. Hannikab. Melik, Khashm el Mús.
10. Adlanab. Melik, Saleh Bey.
11. Rakabíyah.
12. Hakemab, at Belal and Núri.

At Belal and Núri are several Núba families of nearly pure blood, which, though now speaking Arabic, and Arab in habit, appear to have been later immigrants from the south-west at

the time of the Funniyeh supremacy. At Korti are the Bedayriah, a Núba people with an admixture of Arab blood, who still speak Rotana amongst themselves. They are generally classed with the Shagíah, and were until lately under Shagíah chiefs, but their name, derived from Bedayr, the diminutive of Bedr, "the full moon," is Arab; possibly at an early period some numbers of the Bedayriah tribe, now north-north-west of Kordofan, may have established an over-lordship, which was afterwards wrested from them by the Shagíah.

The next in interest and importance is the Já'alín tribe, which formerly occupied the country on both banks of the Nile from Khartúm to Abu Ahmed. The Já'alín claim descent from Abbas, the uncle of Muhammad, of the Koreish tribe, and they are undoubtedly of Arab origin, though the type has been much modified in those clans which took to agricultural pursuits and intermarried with the Núba population. The name Já'alín (sing. Já'alí) does not seem to be derived from any founder of the tribe, but from the root Já'al, "to put," "to stay," and hence it means, in this sense, those who abide or settle. The term Já'alíah (root, Já'al) is still used in the Lebanon for the temporary abodes of the people in spring-time; and Já'alín are therefore what we should call "squatters" on the banks of the Nile. According to their own tradition the Já'alín emigrated to Egypt in the 12th century, and thence worked their way up the Nile, but they appear to have settled in the Súdan before the Shagíah, and probably reached the country at a much earlier date than the 12th century. They were tributary to the Funniyeh kings of Sennár, and must then have been of great importance, for they had a prince of their own race called Wad Agíb, whose family intermarried with the reigning family, and who, under the kings of Sennár, exercised authority as chief of all the Arabs eastward to the Red Sea, and northward to Korti and Mahass. At the date of the Egyptian invasion they were independent, and the strongest of the Arab tribes; at first they submitted, but in 1822 the Saâdab clan rose, under Mek Nimr, who was of the Wad Agíb family, and massacred the Egyptian garrison at Shendi and burned Muhammad Ali's son alive. The rebellion was suppressed in the most ruthless manner; the Saâdab were almost exterminated and their lands given to the Shagíah; and the whole Já'alín tribe was afterwards looked upon with distrust. The Já'alín were practically debarred from Government employment, and from service in the Bashi Bazúk force which was recruited from the more favoured Shagíah; they never became completely reconciled to Egyptian rule, and this may explain the fact that they were the first tribe near Khartúm to rise, and that almost to a man, they went against the government. The

noted Zubeir Pasha belongs to the Jamiab clan of the tribe; he is descended from one of the oldest families, and there is little doubt that, had he been so disposed, he could have kept them loyal and the country north of Khartúm open. It was the existence of this hostile tribe north of Khartúm which made communication with General Gordon so difficult. The Já'alin are now partly agricultural, partly nomad, and they are divided, as far as could be ascertained into the following clans:—

Gereiyat.—Sheikh Wad el Jahúri; nomads between the Nile near Khartúm and Bir Gabra umm Gammal, there are three sections: the Wahalab, Sanitab, and Mukatab; and they number about 1,000 men.

Futahab.—Nomad and riverain on left bank a little below Khartúm.

Sururáb.—Sh. Muhammad Wad es Seyd, agricultural, between Omdurman and Kereri; on left bank.

Jamiab.—Partly nomad partly agricultural; between Jebel Garri and Kerreri, and thence to Bir Gabra in the desert. They were formerly on both banks of the Nile, but now on left bank only. Zubeir Pasha and Feki Mustapha, who blockaded the north side of Khartúm on the left bank, belong to this clan.

Gereishab.—Agricultural; Sh. Wad el Habashi at Wad Habashi north of the Sixth Cataract.

Sáádab.—Agricultural; at Salawa on left bank, and round Shendi on right bank. The Sheikh Wad Hamza of the family of Mek Nimr was the Mahdi's Emir of Shendi.

Suleiab.—Sh. Fayit; nomad and agricultural, Wady el Ahmar, on left bank.

Muhammadab.—Sh. El Khidr, agricultural; near Matammeh.

Kitayab.—Sh. Feki Khalaf Allah, left bank below Matammeh, said by some to be the parent Já'ali clan, and the Sheikh is looked upon as the head of the whole tribe.

Arámelah.—Melik Beshir; agricultural, left bank below Matammeh; they are called the people of Wad Agíd.

The *Jebelab*, *Mukniyeh*, *Aliab*, *Zeidab*, *Temarab*, and *Nafiab* are also Já'ali clans below Matammeh, partly nomad and partly agricultural.

The Já'alin differ so much from the Shagíah in feature that they can readily be distinguished at a glance. Burckhardt says that the true Já'alin from the eastern desert have exactly the same countenance and expression of feature as the Bedawin of Eastern Arabia, and he remarks that their beards are even shorter and thinner. Mr. Van Dyck, son of the well-known Dr. Van Dyck of Beirút, who was with me in the Súdán, compared the difference to that between the Druses (Shagíah) and

Maronites (Já'alín). The typical Já'ali has a nearly perpendicular forehead, a sharp nose, and a rather pointed chin which sometimes projects in a marked manner. The Shagfah has a sloping forehead, a more aquiline nose, and a slightly receding chin. The Shagfah face is long, with a contemplative expression; the Já'ali face is short with a quick, sharp expression as of a smart man of business. The Shagfah have the character of being overbearing as Bashi Bazúks, and hard as masters or land-owners; the Já'alín of being unscrupulous merchants and cruel slave dealers. Both tribes have adopted the African custom of gashing the cheeks of their children; the Shagfah gashes are vertical, the Já'ali horizontal, and the latter say they adopted the custom from the former.

The *Monassir* occupy the cataract country from Birti upwards to the Robatabs; they are partly nomad, partly agricultural, but have no great extent of cultivated ground; the riverain population lives in houses and villages, and the whole tribe numbers about 2,500 men. They claim kinship with the Ababdeh through a common ancestor, Mansúr, brother of Abad, the reputed grandfather of Ababdeh; they are also connected with the Shagfah. Their language is Arabic, and they appear to be, like their neighbours, the Shagfah, of mixed Arab and Núba descent; their connexion with the Ababdeh may be through the Arab blood in that tribe. The Sheikh Suleiman Wad Náman Wad Gamr acquired an evil reputation through the murder of Colonel Stewart and the English and French consuls.

The clans are:—

Hamámíd, at Bir Sáni.

Kahúlah, at Ab Kharít.

Kajabáb, at Bir Jawrah or Jórá.

Walad Gamr, at Wady Gamr.

The *Robatab* are partly nomad, partly agricultural; they occupy the great bend of the Nile at Abu Ahmed, and the island of Mograt. They speak Arabic and claim descent from a certain Robat, or Rabat, of the Beni Abbas; but they are very frequently spoken of as one of the Já'alín clans. They are of mixed Arab and Núba blood, and number about 3,000 men. The heads of the two divisions of the tribe are Melik Muhammad Nabíh who lives at Kuddek, and Sheikh Bishír of Mograt Island.

The *Hassaníyeh* are pure nomads, and apparently of Arab descent. They occupy the desert between Abu Dom (Merawi) and the Nile opposite Shendi; the range of Jebel Garri at the Sixth Cataract; and the left bank of the Nile south of Khartúm. They are thus much scattered, and everywhere they have the same reputation as robbers; they have blood feuds with the

Sowarab and Hauwawír, but intermarry with the Monassír. The Sheikh of the northern section, Wad el Fezari, lives at Bir Ghirir, near the Merawi-Shendi Road.

The *Ghubush*, a small settlement on the left bank of the Nile opposite Berber, are all fakirs, or religious men. They are an offshoot from the Bedayriah, and came originally from Kordofan. They were allowed a subsidy by Muhammad Ali, and afterwards by the Egyptian Government, but they all joined the Mahdi, and one of their number, Muhammad el Kheir, became Emir of Berber after it fell.

The *Meyrifab*, a small semi-nomad tribe on the right bank near Berber, are of doubtful origin. They speak Arabic, and are sometimes classed as Já'alin, but the Já'alin repudiate them; their name does not seem to come from an Arabic root, and it seems a question whether they are not of Bíja origin. It is said that, contrary to Arab custom, they never marry slaves.

The *Awadíyeh* and *Fadníyeh* are two small nomad tribes of pure Arab blood, living in the desert between the wells of Jakdúl and Matammeh; they are often incorrectly classed as Já'alin, but do not belong to that tribe; the former is more nearly allied to the Robatab. They have large numbers of horses and cattle but no sakihs; the horses are of the celebrated black Dongola breed, and some mounted men of the former tribe charged one side of the square at Abu Klea with much spirit. The Sheikh of the Awadíyeh is Beshír Wad ed Dabba, and of the Fadníyeh, Muhammad Wad el Feki ez Zein.

The *Battakhín* occupy the banks of the Blue Nile near Khartúm; and it was with them that General Gordon fought most of his battles near Khartúm. Their Sheikh, El Obeid, inflicted the crushing defeat on General Gordon's troops on the 4th September, 1884, which was the proximate cause of the journey of Colonel Stewart and the consuls, and which virtually sealed the fate of Khartúm. Bruce calls them "a thieving, pilfering set," but none of them were met with by the Nile Expedition, and I can only suggest that they are like the Já'alin, of mixed Arab and Núba descent.

The *Shukríyeh* is a large tribe of nomads between the Atbara and the Blue Nile; the name is of Arab formation, but nothing is known of the history of the tribe. They remained neutral under their Sheikh, Muhammad Aud el Kerím, and have always held aloof from the Mahdi and the western Arabs.

The *Baggarah* tribes of Kordofan, so called from their being great cattle owners and breeders, are true nomad Arabs; they have intermarried little with the Núba, and have preserved most of their national characteristics. The date of their appearance in the Súdán is uncertain; they appear to have drifted up the

Nile Valley and to have dispossessed the original Núba population and driven it to the hills. The Dughaim was, as we have seen, on the left bank of the Nile between Assiút and Assúan in the 14th century, and the Jeheineh in Upper Egypt in the 15th century; of the other tribes we have no record. The true Baggarah tribes use oxen for saddle and pack animals; they carry no shield, and their arms are the lance and the sword. The men are perfect types of physical beauty, with fine heads, erect athletic bodies, and sinewy limbs; they are hunters and warriors, and are much superior to the indigenous races in mental power. They constituted the real fighting force of the Mahdi, and charged the English squares at Abu Klea and Gubat with the greatest determination. It was these tribes that destroyed Hicks' army, captured Obeid, and inflicted most of the defeats on the Egyptian Army; and their decision to follow the Mahdi out of their own country to Khartúm caused the fall of that place. The Baggarah have never been properly studied, and even the names of the tribes are uncertain; those best known are:—

Hawazma or Hawazim.—South of Obeid. Sh. Nawwai.

Kenana.—South-west of Abu Haraz; fought at Abu Klea and were almost annihilated; in 1821 they were south of Sennár.

Dughaim.—Borders of Darfúr; lost heavily at Abu Klea.

Habanieh.

Beni Jerar.—South-west of Khartúm. Sh. Ibrahim Wad el Melia.

Mahalia.

Bedayriah.—North-north-west of Obeid.

Hadiyat.

Rizegat.—South-east of Dara.

Hamr.—West of Obeid, are really not Baggarah, as they own large herds of camels, and used to be carriers of goods between Darfúr and Obeid. They have a blood feud with the Kabbabish.

Jawamáah.—Lost many men at El Gubat.

Jalídat.

Majanín.

Fedayan.

Howara.—Sh. Abdul Kadi Abu Hasneh.

Ta'áysheh.—Darfúr. Sh. Abdullah of this tribe succeeded the Mahdi, and appears to be one of the most energetic of the Arab leaders.

Jeheineh.—Darfúr; were in Upper Egypt in Macrizi's time, beginning of 15th century. A branch of the tribe, the Rufye or Rifaa is south of Sennár.

Ma'áli.

Jámah.

III.—Núba.

The old Arab geographers divided the Núba country into Merys, Baku, and Aloa.¹ Merys apparently extended from Assúan to the head of the cataracts at Hannek; Baku was the Dongola district, and Aloa was the Sennár kingdom, of which the dependencies reached down to the borders of Dongola. Selim el Assúani, as quoted by Macrizi, gives some interesting details of these countries; Merys, in which the Merysy language was spoken, was governed by a governor called the "Lord of the Mountain," who was appointed by the great chief of the Núba. Near Berber there was a Bija tribe, Zenafej, which had its own language, and did not intermarry with the Núba, but which received a chief appointed by the Núba. On the Atbara, however, the Núba and Bija intermarried and were called Deyhún and Nara. The king of Aloa resided at Souba, of which the ruins exist at Soba on the Blue Nile; he wore a gold crown, had a large army, and was possessed of much power. The people he ruled over were Christians, whose bishops were nominated by the Patriarch of Alexandria; their books were in Greek, which they translated into their own language, and they had many churches.² I have mentioned these details chiefly to show that for several centuries there was a compact and strong Christian kingdom in the Súdán, founded and administered by Núbas, and also as tending to show that the Arab domination in Sennár must have been very brief, for the new Núba kingdom was founded there early in the 16th century. The Núba are an essentially agricultural people, and, as far as we know, indigenous to the country.³ They form the basis of the population of the Nile Valley from Assúan to Korti, and are widely spread over Kordofan, Darfúr, and Sennár. Between Assúan and Korti, the terms Núba and Bija are still in use to distinguish the Rotana from the To-Bedawiet speaking people. Rotana, the name used to distinguish the Núba language, has passed into Súdán Arabic as a verb, and the people use it in the sense of "to *rotan*" in Turkish, English, &c. The Núba of the Nile Valley are divided into three sections—the Kenús, Mahass, and Danáglas, all speaking Rotana with certain dialectic differences; the dialects of the first and last agree more nearly with each other than they do with that of Mahass: and this last again more nearly ap-

¹ See note, p. 4.

² There is also a record of an important Núba embassy which was sent in great state to Baghdad by the Núba king Zakarya ibn Bahnas, under his son Fayrakeh.

³ Selim el Assúani says that Salha, the forefather of the Núbas, and Mokry of the Mokras, came from Yemen, and were descended from Hemyar; also that the Núbas and Mokras spoke different languages. The present representatives of the Mokras are not known.

proaches the language of the Núba of Kordofan, who represent the original stock.

The Kenús apparently take their name from the Beni Kens,¹ a branch of the Rabya tribe which entered Egypt with Amr, and took part in the conquest; some of the Aleykát also settled in the Kenús district, which extends from Assúan to Wady Halfa; and so also did the Bosniacs who came up the river during Sultan Selim's reign, and many Turks and Albanians since that time. In several villages the large admixture of foreign blood has greatly modified the Núba type, but in manner and habit the people are still Núba. The Mahdi was descended from a Beni Kens family which emigrated two or three generations ago to Dongola; he hence claimed descent from the Koreish tribe, but in feature and colour his family could not be distinguished from the surrounding Núba.

The Mahass, who claim descent from the Koreish are really of purer Núba blood than the Kenús and Danáglas; the reason of this seems to be that until the recent operations all traffic, or nearly all, up the Nile went by the left bank and hardly touched Mahass. The Mahass repudiate all relationship with the Kenús and the Danáglas, but on the other hand they claim kinship with the Já'alin, and I heard from other sources of a Mahass settlement in the Já'alin country not far north of Khartúm. The Mahass never marry slave girls as the Kenús and the Danáglas do, and this has also tended to keep their blood pure.

The Danáglas or Dongolese were, before the Memlúk invasion, always governed by the Zubeir family, of which the present representative is Tombol ibn Zubeir, the Melik of Argo, and were tributary to Sennár. They have a large admixture of Arab, Turk, and slave blood, but except in Ordeh, where Rotana is not spoken, they are Núba in type and language. The Danáglas are great agriculturists, and they have followed the Egyptians to various places in Kordofan, such as Bara, which, by their skill in irrigation, they have turned into fertile oases. They are also acute and intelligent traders, and the most pertinacious and active of slave hunters and slave dealers. Egyptian misgovernment and over-taxation having ruined the country and forced a large portion of the agricultural population to leave, their place has partially been supplied by slave labour, and it is calculated that nearly two-thirds of the population of the Dongola province is slave.

To the Núba race belong the Ghodyat and other tribes that form the mass of the agricultural population of Kordofan; the

¹ The Beni Kens are said to have first conquered Dongola and built a mosque there.

Kungára of Darfúr; and I believe the sedentary population of Sennár. Racial purity is, however, best preserved by the tribes of Jebel Daïer, J. Takalla, and Dar Núba. In these mountain fastnesses the Núba have maintained their independence against Arab and Egyptian, and on the terraced hill-sides they have grown sufficient corn for their simple wants. During the supremacy of the Funníyeh kings of Sennár, when the Arab tribes were kept under control by an army of negroes, the Núba had greater freedom of movement, and there is a Núba settlement between Debbeh and Abu Gússi, which only established itself on the Nile at the commencement of the present century.

The Núba are lighter than the Negro, and darker than the Arab; their noses are less flat, their lips less thick, their cheek bones less projecting than the negroes; and their hair is not woolly but curled and wiry. The character of the Núba, and their habits have been pictured by a master hand, that of Burekhardt, and I need say no more than that I agree with him that they are "a people of frolic, folly, and levity; avaricious, treacherous, and malicious; ignorant and base; and full of wickedness and lechery."

Explanation of Plate I.

Sketch-map, shewing the distribution of the tribes in the Nile Valley, north of Khartúm.

DISCUSSION.

MAJOR C. M. WATSON, R.E., said that he could add but little to the very interesting paper which Sir C. Wilson had read, and which contained so much information with regard to the various tribes in the Eastern Súdán. It is worthy of note that there have been two distinct lines of immigration from the East into the Nile Valley, the one by way of the Isthmus of Suez, and the other across the Red Sea from the Arabian coast. So far as one can judge, the former was the most ancient route, and the Ababdeh Arabs, whose ancestors probably came that way were in the country long before the Amarars, Hadendoa, and Beni Amer, who regard themselves as having crossed at a comparatively recent period. The two former tribes speak the Tobedawi, or, as they call it themselves, the Bedy language, while the Beni Amer talk a dialect akin to Tigre. This seems natural when it is remembered that before the Turkish conquest of the Red Sea Coast, the Abyssinian kingdom, or, at all events, the Abyssinian suzerainty extended as far north as Suakin. Pilgrims from Abyssinia to Jerusalem used, at that time, to be escorted by Abyssinian troops to Suakin, where they took an Arab escort, who conducted them across the Bisharin mountains to the Nile.

The Morghani family, of whom Sir C. Wilson spoke, are well worthy of notice. They believe themselves to have originally come from Bokhara, and certainly the leading members are decidedly Mongol in appearance. The family is the head of the great Morghani sect, which has up to the present exerted so powerful an influence throughout the Súdán, an influence which in the late troubles was always exerted against the rebellion and in favour of peace. The late Seyid Osman El Morghani did all that lay in his power to prevent the spread of the rebellion in the vicinity of Kassala, and his two sisters, who lived at Shendy, did all they could to assist General Gordon. It is worthy of note, and is a proof of the influence of Morghanis that although these two ladies have always been openly opposed to the Mahdi and lived in a district in which most of the inhabitants joined his cause, yet they have been respected and uninjured up to the present time. The conduct of the Morghani sect compares favourably with that of the Senoussi to whom Sir C. Wilson also alluded as having so much influence in the northern parts of Africa and who have positions of influence on the roads leading from Tripoli, Tunis, and Algiers to the interior. The Senoussi are very fanatical, and are strongly opposed both to Christians and to Turks, whom they appear to regard as debased followers of Islam. As all accounts tend to show that the sect of the Senoussi is spreading and its influence is increasing, we shall probably hear more of them later on.

CAPTAIN C. R. CONDER, R.E., remarked that it would be presumption on his part to say anything much after the exhaustive and valuable paper just read, since he had served only in Lower Egypt and had no special knowledge of the Súdán tribes. Two points, however, struck him in the paper, and one point in Major Watson's speech.

The practice among the Núba tribes of tracing descent from the mother, recalls the ancient practice of Arabia on which Professor Robertson Smith has written a learned work and which is supposed to be connected with primitive polyandry. It has always seemed to the speaker that there was no evidence that these two customs ever prevailed among Semitic peoples; and that the polyandrous people mentioned by Strabo in Southern Arabia, must probably like the Núba, have belonged to a Hamitic or Cushite race, akin perhaps to the non-Semitic Cossai or Cutheans of Elam, whose name is said to mean "dark," and whose coloured representation as a dark, straight-haired race has been discovered it is said on bas reliefs by M. Dieulafoy at Susa. This dark race called the Aithiops of Asia, by Herodotus (who says they differed from the Æthiopians of Africa, in having straight instead of curly hair) was perhaps distantly connected with the Akkadians and with the Hittites, and according to Lenormant with the Dravidians of India. Is it not possible that the Núba may be a branch of this race, which crossed over, as the Arabs also did, from Southern Arabia

into the Súdán? We have much evidence of such migration from Arabia, not only in the traditions of the tribes, or in history, but also in the derivation of the Amharic and Æthiopic alphabets from the old alphabet of Yemen.

The second point concerns the name of the Jahalin. Sir C. Wilson will remember that there is a tribe so called in Southern Palestine, between Beersheba and the Dead Sea, and while investigating the meaning of the word, Captain Conder found it was connected with *Jahl* "ignorant" or "simple," a term used by Moslems to signify those who lived before Islam, and who were "ignorant" of the truth. Possibly the name shows that the Jahalin are an archaic people, who were so named by Moslem Arabs at a time when they themselves were non-Moslems, just as *Kafir* (*Caffre*) is an Arab name for the Bantu peoples of South Africa, signifying "Pagans," and not a real ethnical title.¹

Major Watson mentioned that the Morghani family came from Bokhara. This is the centre from which many of the secret Moslem societies (Dervish orders) have spread; as for instance, the Bektashi. The freemasonry of the Dervish orders is well known, and the Morghani influence appears to show that they form such a religious order, although they are not one of the "regular" orders, of which there are more than forty. The influence of these orders if properly used might be made one of the best resources of sympathetic native government in the East.

Mr. BOUVERIE-PUSEY and the PRESIDENT also joined in the discussion.

Sir CHARLES WILSON said in reply that he could not agree with Major Watson that the To-Bedawiet speaking tribes were Arab (Semitic), though they have many Arab customs, common to all nomads, and the Sheikh families are of Arab origin. They may, however, have belonged to a Hamitic race in Southern Arabia, and have, as Captain Conder suggests, emigrated thence to the Súdán. With regard to the origin of the name Já'alín, that which the author had given, on the authority of Mr. Van Dyck, who was well acquainted with the tribes of Palestine, and the peculiarities of Syrian Arabic, was he thought correct.

¹ Is not *Bedu* or *tobedawi*, the language of the "desert" (as the words in Arabic would imply), showing that it is the tongue of the dwellers in the desert as distinguished from the Arabic of the towns and of the settled country?

FEBRUARY 22ND, 1887.

FRANCIS GALTON, Esq., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of JOSEPH STRAKER, Esq., LL.B., of 10, King's Bench Walk, Temple, was announced.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From DR. G. A. COLINI.—*Cronaca del Museo Preistorico ed Etnografico di Roma.* 1884, 5, 6.

From the AUTHOR.—Report on the Human Crania and other bones of the Skeletons collected during the voyage of H.M.S. "Challenger," in the years 1873-1876. By William Turner, M.B., LL.D.

— The Physical Anthropology of the Isle of Man. By John Beddoe, M.D., F.R.S.

— Le antiche stazioni umane dei dintorni di Cracovia e del comune di Breonio Veronese. Nota del L. Pigorini.

From the ACADEMY.—Atti della Reale Accademia dei Lincei. 1885-86. Rendiconti. Vol. II. Fas. 12.

From the BATAVIAASCH GENOOTSCHAP VAN KUNSTEN EN WETENSCHAPPEN.—De vestiging van het Nederlandsche Gezag over de Banda-eilanden.

— Realia. Deel III.

From the EDITOR. *Nature.* Nos. 902-903.

— *Science.* Nos. 208-210.

— *Photographic Times.* Nos. 281-2.

— *Revue d'Ethnographie.* 1886. No. 5.

— *L'Homme.* 1886. No. 23.

Professor FERRIER delivered a verbal address of which the following is an abstract:—

On the FUNCTIONAL TOPOGRAPHY of the BRAIN.

By Professor D. FERRIER, M.D., F.R.S.

DR. FERRIER opened a discussion on the question, How far recent investigations on the functional topography of the brain could be brought in relation with craniological and anthropological researches with a view to establish the foundations of a scientific phrenology? The subject seemed to him to fall naturally under three heads:

1. How far can we yet speak of a functional topography or localisation of function in the brain as having been established?
2. How far is it possible by anatomical investigation of the brain to form an estimate of the powers or capacities of the individual?
3. How far can we arrive at the same result by examination of the cranium or head of the individual?

In respect to the first head, he said it was now almost universally accepted—in opposition to the doctrines of Flourens—that there were definite regions of the brain specially, if not exclusively, concerned with specific functions in the domain of motion or sensation. He then proceeded to describe the position of the various centres of sensation and motion according to the lines laid down in his work on the “*Functions of the Brain*” (1886). But only one of the aspects of brain function, viz., the physiological, had been determined. The other, or psychological aspect, the correlations between the physiological and psychological, and the anatomical substrata of the brain, were yet far from being clear. And yet until these correlations were definitely established, we could not consider a practical flesh-and-blood psychology applicable to the needs of the physician or anthropologist as having any existence.

The phenomena of disease, specially those relating to aphasia, indicated that the sensory and motor centres, besides being the medium of sensation and voluntary motion, were also the centres of registration and reproduction of our conscious experience and motor acquisitions; and of these in their respective cohesions and accompaniments, the fabric of mind was to be constructed.

Passing to the second head, he remarked that the determination of functional capacity from anatomical investigation of the brain involved many considerations and difficulties. Mere size of parts could not be considered a satisfactory criterion. We require to know something respecting the size of the individual, and the relation of brain to the sectional area of the nerves with which it was connected. We require to know, also, something as to the activity of the circulation and tissue change. And above all, we require to know much respecting the structure of the grey matter, its cells, processes, &c. Supposing all these points determined, then we might say that there is a relation between the size of a given region and the function with which it is related. He illustrated this point by reference to the facts of comparative anatomy, more particularly as regards the sense of smell, and also by local atrophies induced by congenital absence or early

removal of organs of sense and motion. And he then went on to consider, in detail, what might be indicated in a physiological and psychological view by relatively high development of particular regions. As to the frontal lobes, he expressed his belief that they were related to the higher intellectual faculties by forming the substrata of attention.

On the third head, he remarked that the difficulties as to the determination of capacity were greater than those involved under the second head. For though the skull might be considered as a mould of the brain, yet it was impossible to determine from the skull alone, whether the brain were sound or not; and all the finer complexities of convolution and details of structure were beyond our ken. Mere obvious differences in size of different lobes and regions were all that could be made out by craniological examination. That great differences did exist there was no doubt, and he instanced cases of idiocy and infantile cerebral disease in which marked abnormalities and asymmetries of the skull were very evident, and confirmatory of the conclusions as to the localisation of function otherwise determined.

In determining the greater or less degree of development of particular regions, they had as their guide the cranio-cerebral researches of Broca, Turner, and others. Whether these were as yet fine enough for the anthropologist, though perhaps sufficient for the surgeon, might, however, be questioned.

He described by reference to diagrams what had been determined in respect to the position of the main lobes, fissures and convolutions. In conclusion, he remarked that the data of a scientific phrenology were, as yet, very deficient; but there was reason to believe that if the subject were taken up from different points of view, by the anatomist, physiologist, psychologist, and anthropologist, great progress might be made.

DISCUSSION.

The following notes were sent by Dr. LAUDER BRUNTON, F.R.S., subsequently to the meeting:—

As regards the possible change in the shape of the skull from development of the different centres, it seems to me that if a cortical centre expands in all directions, the number of cells in the longitudinal direction being much greater than in the transverse direction, the *actual* longitudinal increase will be much greater than the transverse, the *proportional* increase to the original size being the same. The development of the visual centre will thus tend to raise the vertex and elongate the head from above downwards, while the development of the auditory centre will tend to push the occiput backwards, and elongate the head in an antero-

posterior direction.¹ Whether the development of the tactile centre will render the head broader or not I could not be sure, but it seems to me that this is just possible. I have tried by the accompanying diagram to make my meaning more clear.

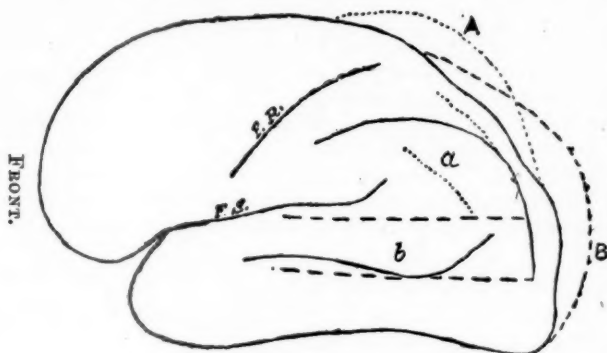


DIAGRAM OF BRAIN

Showing how an increase in the visual or in the auditory centre might change the shape of the skull.

F. R.—The fissure of Rolando.

F. S.—The fissure of Sylvius.

a.—The visual centre.

b.—The auditory centre.

A.—Dotted line, showing how an increase of *a* might change the shape of the skull.

B.—Broken line, showing effect of increase of *b*.

I think one may with advantage take into account that throughout the animal kingdom generally, or at least among mammalia generally, the part of the male is to go out and find food for the family, while that of the female is to rear the young ones. Corresponding with the different division of labour between the male and female we may expect to find a different distribution of qualities, and consequently a different development of the centres in the brain. The duties of the male require development of motor power rather than of sensory; those of the female require sensation, and what may be regarded as based upon sensation, emotion rather than motor power. I do not know whether in mammals generally we find greater development of the motor centres as compared with the sensory in the male, and of the sensory as compared with the motor in the female. I think, however, that this is the case to a certain extent in the human race, and that if we compare the skull of a man with that of a woman we

¹ These ideas do not appear, however, to be well supported by a case which Benedict (*"Neurologisches Centralblatt,"* 1886, No. 10) records of congenital blindness in which the eyes were healthy and the blindness probably depended on imperfect development of the cerebral centres for vision. The occiput in this case was abnormally flat.

find that the former is more largely developed anteriorly, and the latter posteriorly.

Dr. RAYNER remarked that one great difficulty in arriving at an estimate of the mental powers and characteristics of individuals from an external examination of the head, arose from the great diversities of shape in disease, and even in apparent health; a skull which the speaker had a recent opportunity of examining was enormously scapho-cephalic, apparently from premature arrest of development of the frontal bone; in that case the relations of the subjacent brain to its bone covering would have been very different from that which usually attains. In spite of this and other difficulties, he believes that it would be ultimately possible to arrive by external examination at a conclusion, in the majority of instances, in regard to the mental characteristics of an individual.

Sir JAMES CRICHTON BROWNE, Mr. BOUVERIE-PUSEY, Prof. THANE, Prof. FLOWER, and the PRESIDENT also took part in the discussion.

Mr. HYDE CLARKE not having the opportunity of speaking at the close, said he should put his communication in writing. He supported Professor Ferrier's doctrine, that energy or rapidity of thought is an important factor, and referred to the result of his own experiment of fifty years ago, recorded in the "*Journal of the British Association*," 1870, and in that of the *Statistical Society*.¹ In confirmation of the Professor's statement that the range in the same individual may greatly vary, he points out that in this case the difference (p. 359) was 25 or 100, or between 1 and 4 in the same individual within ten days. With regard to the Professor's deductions as to men and animals in the matter of speech language, and particularly as to aphasia in men and non-imitation of speech by animals, the attention of the Professor was called to the origin and position of speech language. His postulate was that speech language is a natural and original attribute of man. If, however, there had been an epoch of gesture or sign language antecedent to the origin and development of speech language, then the latter could not be regarded as primary. The state of gesture language was gone through by most infants, and in some cases, though able to articulate, they remained in this state of mutes until five, six, or seven years old. They would understand, as many a dog does, words addressed to them, but would not communicate by speech even with their speaking brothers and sisters.

His own observations upon the mutes of the Seraglio, at Constantinople, and upon other examples of gesture language showed him that within its limits, gesture competed well with speech, and he considered that the gesture of the mutes was quite equal to ordinary spoken Chinese for communication. The development of the faculty of speech might lead to a greater development of the

¹ 1871, page 359.

nerve organs of speech and hearing, while psychologically speech in man became the means of creating a greater number of verbal and other ideas and impressions. In gesture language hearing counted for very little, sight being used instead. Indeed there was ample field for experiment. It was difficult to conceive that animals did not speak from defect of attention, as deposed by the Professor. The cat or the dog exhibits the quality of attention in a high degree when watching for prey. Many animals are imitative of others, as, for instance, the cat in imitation of the dog. That animals communicate to some extent with each other must be admitted, but the subject is obscured by the assumption that speech must be the vehicle of communication. In the case of the two trained French pointers that were exhibited some thirty years ago before the Fellows of the Linnæan Society, when the Bishop of Norwich was President, their extraordinary performances were little guided by sound, but by signs, which they most sagaciously followed. Indeed, in the training of all performing animals direction by signs played a chief part. The mind of such animals as the dog must be the same as that of men, and of the same types psychologically, as the diagrams of the Professor showed it was physiologically, and the conditions depended as strictly on the relative development, as distinctly indeed as did the special development of the sense of smell. The distinction from men lay in that development, and in the registration of the verbal ideas of speech. Hence the more complex convolutions and details of the brain of the civilised man. The number of ideas registered or impressed did not depend on conscious thought, but also on unconscious thought, of which law he himself had been the first discoverer, though Dr. W. B. Carpenter obtained prior publication, and who named it unconscious cerebration. The subject of registration taken in hand for investigation by Professor Ferrier was a most important one, and one as obscure as any other portion of the subject, and it might be said as wonderful. To a certain extent the experiments and investigations of Professor Graham Bell and of Professor Hughes, as to the physical registration of sounds had of late years prepared the way for the study of the registration of ideas. A record of sounds could be made to reproduce those sounds, whether of speech or of music, at a later and distant period. He much regretted that the Anthropological Institute had hitherto taken so small a part in investigations, of the importance and value of which Professor Ferrier had that evening given convincing evidence. He regretted that the section for comparative psychology, of which he had been appointed chairman some years ago, had not been allowed to act, as members had unfortunately taken up the spiritualistic practices, to which Sir Crichton Browne had referred. What was wanted was observations in every branch of natural history on man and animals, for the animal physiologically and psychologically often supplied better illustrations than did the human being.

The following paper was then read by the author:—

DESCRIPTION of the CEREBRAL HEMISPHERES of an ADULT AUSTRALIAN MALE.

By H. D. ROLLESTON, B.A., Scholar of St. John's College, Cambridge, Junior Demonstrator of Physiology in the University.

[WITH PLATE II.]

THIS communication is divided into three parts: (1) a few general remarks; (2) a detailed summary of the two hemispheres together; and (3) a description of the two hemispheres separately, with the depths of the fissures and sulci.

General Remarks.

The interest attaching to the study and examination of the brains of the lower races of mankind is briefly summed up in the phrase, "brain as an organ of mind." The problems that come before us are attractive, and, to a certain extent, admit of an answer. What material differences are there between the brain of an educated moral man and that of a sensual, animal-like savage? What correlation is there between the physical conformation of the cerebral hemispheres and the mental development of their owner?

This brain of an adult male Australian is of interest, then, from its being that of a primitive man.

The Australian came to the hospital at Adelaide, and on his death from peritonitis, his head was cut off and despatched in spirit by Professor Watson to Professor Macalister, to whose great kindness I am indebted for this opportunity of describing such an interesting brain.

On removing the brain it was found to weigh 31 ounces. A fresh brain if weighed before and after lying in spirit will be found to lose weight. Therefore, to obtain the weight in the recent condition, a certain percentage must be added to the actual weight of a brain which has been for some time in spirit. Marshall ("Phil. Trans.," 1864) adds seven twenty-fourths (the mean between one-third and one-fourth) of the weight obtained, and thus obtains the probable weight in the recent condition. Dr. Thurnum ("Journal of Mental Science," April, 1866) allows 29 per cent. for shrinkage in spirit.

The Anthropological Society of Paris adds 38 per cent. of the weight of the brain, and this result is more likely to approximate to the truth, for it must be remembered that about 80 per cent. of the weight of a fresh brain is due to water, the removal of

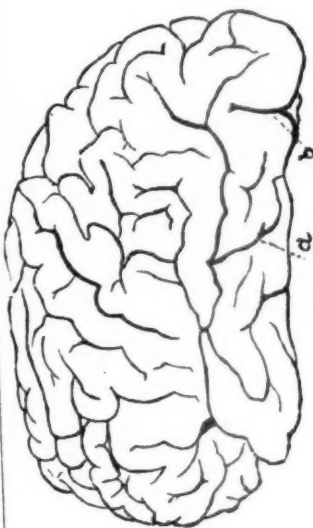


FIG. 1



FIG. 2 q

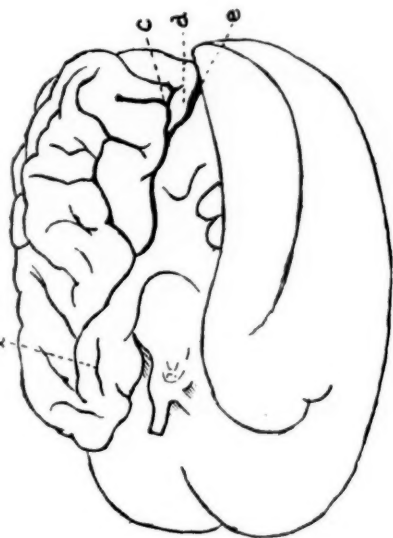


FIG. 3

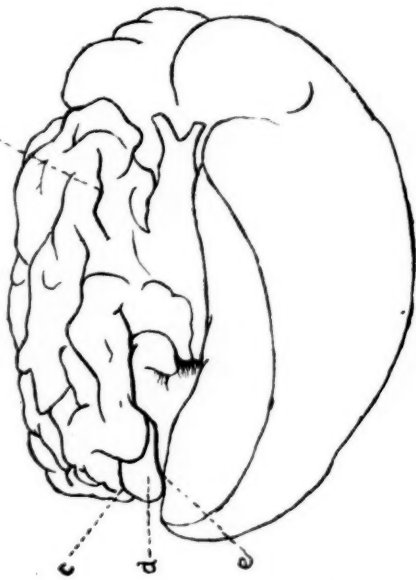
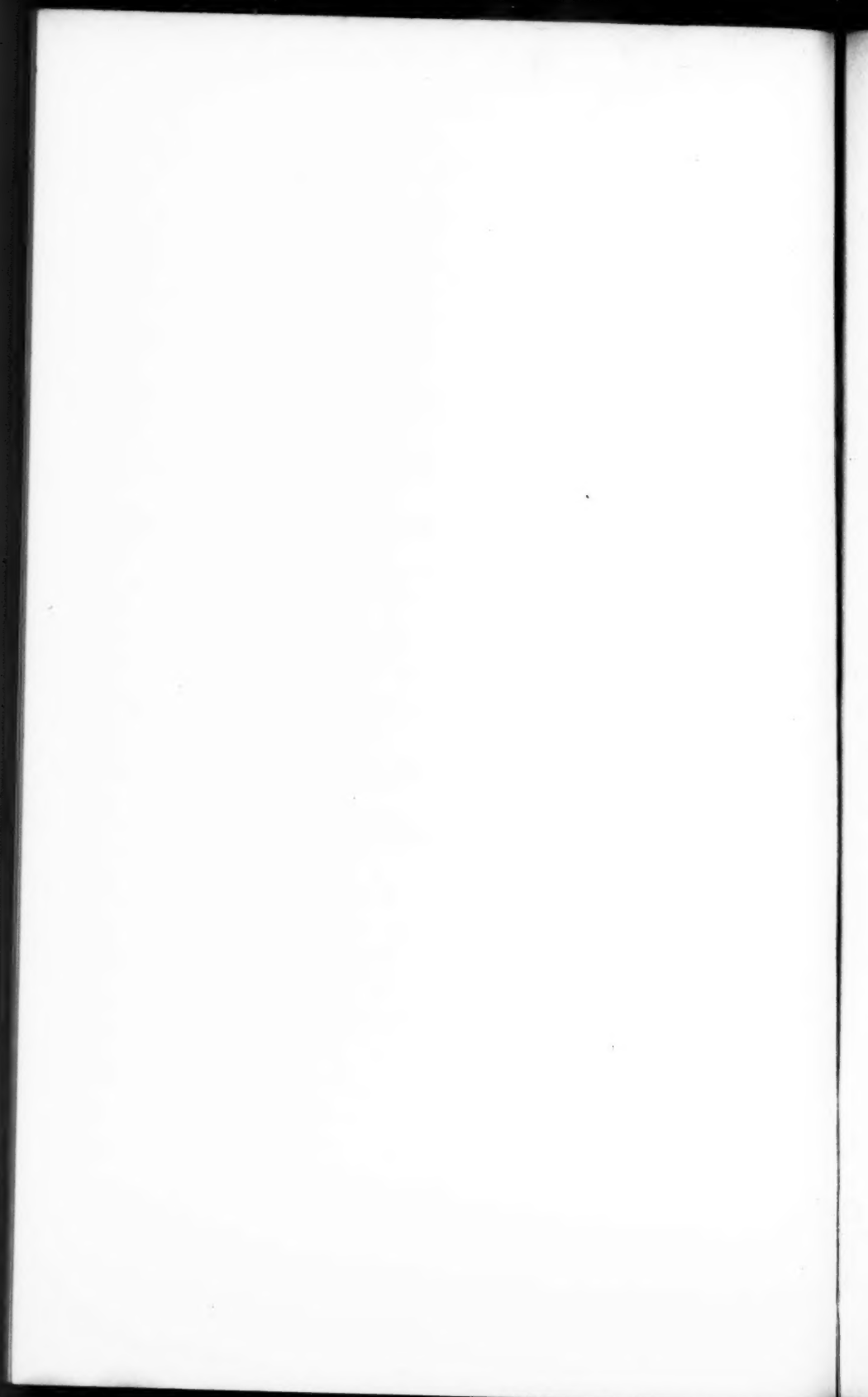


FIG. 4

BRAIN OF ADULT AUSTRALIAN MALE.



which by alcohol accounts for the greatly shrunken condition of brains preserved in spirit.

Adding, then, 38 per cent. of the actual weight (31 ounces), the resulting weight of 43 ounces may be taken as representing, with a fair approach to accuracy, the weight of the brain at the time of death.

So far very few Australian brains have been weighed: the average of six was found to be 41 ounces, two of these brains, it should be noted, are those of females.¹

The weight of the brain as a racial character is a subject which has attracted a good deal of attention, and as the result of colossal tables, it may be taken that the average European brain weight in males is 49 ounces, the average weight of the negro race is about 44·3 ounces,² which it will be seen is in excess of that of the primitive Australian.

The age of the Australian was unknown, but his face, which is preserved in the anatomical museum of the University of Cambridge, shows no sign of age, but appears to be that of a man about the prime of life.

If the convolutions of this Australian brain be compared with those of an average European brain the simplicity of the former is at once thrown into relief.

The convolutions of the frontal lobe, which is connected with intellectual processes, are seen to have a marked antero-posterior arrangement, to be four instead of three in number, and to be separate, not to join each other at every turn and twist, as is so notably the case in the described brains of many eminent men, and generally in the more civilised nations.

This simplicity of the frontal region is a point of importance, and may be considered as characteristic of a primitive brain. The frontal lobe being associated with higher faculties, it has been thought that the relation of amount of brain substance in front and behind the fissure of Rolando is of almost equal importance with the features mentioned above; but in this brain the relation of amount of brain substance in front and behind the fissure of Rolando was much the same as in an average European brain.

It has also been thought that the præ-auricular development of brain is of importance from the same point of view, but this requires working out.

¹ Dr. Thurnum ("On Weight of Brain," "Journal of Mental Science," April, 1866), gives the ratio of the cubic capacity of male Australian skulls to European as 85:100. Now, the average brain weight of an European, according to Welcker, is 49 ounces, and assuming that the relation between cubic capacity of the skull and brain weight is approximately true, the brain weight of Australians would be 41·6 ounces. It will be seen that this deduction agrees fairly well with the result obtained in the brain under notice by adding 38 per cent. of the actual weight.

² Thurnum: *loc. cit.*

Throughout the convolutions this defined condition will be seen, and especially is this the case as regards the occipital lobe. Gratiolet, in his "*Mémoire sur les plis cérébraux de l'homme et des Primates*," insisted on the importance of the "plis de passage," or annectant gyri, in a differential diagnosis between them, and it was stated that in the Chimpanzee the first and second annectant gyri were depressed below the surface of the cortex, while the third and fourth remained in a superficial position.

Leaving this somewhat disputed point,¹ it is interesting to note in the human cerebral hemispheres under discussion that there is a tendency to depression and suppression of the third and fourth annectant gyri, while the first and second annectant gyri, though small, retain their superficial situation. In the brain of the Bushwoman described by Marshall ("*Phil. Trans.*," 1864), the annectant gyri were found to be small and single.

The anomalous fissures in the temporo-sphenoidal lobe (more marked on the left side) which tend to cut off the temporo-sphenoidal lobe, or more exactly, the middle and inferior temporo-sphenoidal convolutions from the third and fourth annectant gyri, and in turn to separate the third and fourth annectant gyri (or the cortex representing them) from the occipital lobe, are described in detail in the following pages and figured in Pl. II, figs. 1 and 2.

An anomalous transverse fissure which divides the postero-parietal lobule into an anterior and a posterior part is noteworthy.

Perhaps the most noticeable feature in this brain is the great reduction in size of the cuneate lobule and the great development of the parieto-occipital fissure, which is seen to contain the inner part of the cuneate lobe, and also part of the calcarine fissure. *Vide* Pl. II, figs. 3 and 4.

In the plates of Marshall's "Bushwoman," the cuneus is depicted as decidedly smaller than in an European brain, but bigger than in this brain; in his description of two idiots' brains it is described as being extremely small.

After noting the simplicity of the general arrangement of the convolutions it is interesting to observe that the angular gyrus is the most convoluted part of the hemisphere, and that the uncinate gyrus, another local habitation of special sense, is not only actually bigger in this shrunken brain than in an average European, but has a blind sulcus placed in it. (Figs. 3 and 4.)

¹ *Vide* Turner, "*Proc. Royal Soc. Edinburgh*," 1865-6. Rolleston, "*Nat. Hist. Review*," 1861. Article I.

Detailed Summary of both Hemispheres.

Lobes.—Frontal, arrangement simple, tendency to have four longitudinal instead of the usual three frontal gyri is perhaps worth notice. The general absence of secondary gyri is with two other features a primitive condition.

The transverse frontal sulcus is well developed, but does not run into the horizontal limb of the fissure of Sylvius, as is often the case when well developed.

Orbital surface has its gyri simple and the sulci somewhat shallow, but asymmetrical.

Simplicity of orbital surface is characteristic of primitive brains.

The sulcus of Rolando is confluent with the longitudinal fissure.

The island of Reil is exposed on left side, this exposure is a condition found in primitive brains; thus Marshall ("Phil. Trans.," 1864) figures it in the brain of a Bushwoman, and quotes other examples. The exposure of the island of Reil implies that the surrounding gyri are ill-developed, Broca's convolution is thus shown to be defective, a point of interest in an Australian savage whose language is primitive as shown by its unclassified character.

Parietal.—The postero-parietal lobule is divided into (a) an anterior; and (b) a posterior portion, by a transverse sulcus which starts from the longitudinal fissure, 12 mm. behind the end of the calloso-marginal sulcus, and 25 mm. in front of the external parieto-occipital fissure.

The supra-marginal gyrus is cut off from the ascending parietal gyrus by the confluence of the interparietal sulcus and the horizontal limb of the fissure of Sylvius.

This continuity of the interparietal sulcus and the horizontal limb of the fissure of Sylvius is one of the many examples in this brain of the defined and separated state of the convolutions. The absence of a gyrus crossing the lower end of the interparietal sulcus and joining the ascending parietal and supra-marginal gyri, means less grey matter and therefore a lower potentiality.

A like condition is described by Gratiolet in a Bushwoman, and figured by Marshall on the left side of the Bushwoman's brain described by him ("Phil. Trans.," 1864).

The angular gyrus is the most convoluted part of the hemisphere. In Marshall's "Bushwoman" the angular gyrus was found to be decidedly defective.

Occipital.—The third and fourth annectant gyri, more especially on the left side, have but a slight connection superficially either with the occipital or the temporo-sphenoidal lobes.

The external parieto-occipital fissure is small and bifurcated at its origin. In the *Quadrumana* this fissure is much more marked, and in human brains it has been seen stretching two inches transversely outwards (Turner, "Convolutions of Human Cerebrum," page 12). It is of interest to note in this primitive brain no approach as regards this point to condition in *Quadrumana*.

The occipital lobes completely hid from view the cerebellum when the encephalon was viewed from above, at one time this was thought to be an important point in estimating brain power in different types, but it has been shown to be quite destitute of any importance.

Temporo-sphenoidal lobe.—The most notable feature is the presence on both sides of two anomalous transverse sulci, which tend to cut off the middle and inferior temporo-sphenoidal gyri from the third and fourth annectant gyri, and also to limit superficially the connection between the third and fourth annectant gyri on the one hand, and the occipital lobe on the other.

As these anomalous sulci are not entirely symmetrical, it may be as well to describe them briefly.

On the left side the anterior of these two transverse sulci (*a*, *vide* fig. 1, Pl. II) arises from the inferior temporo-sphenoidal sulcus, 7 cm. behind the most anterior extremity of the temporo-sphenoidal lobe, and runs into the parallel sulcus, thus it cuts off the middle and inferior temporo-sphenoidal gyri from their natural continuation, the third and fourth annectant gyri.

The posterior transverse sulcus (*b*, fig. 1) arises from the lateral, 3.4 cm. behind the anterior one, and runs almost into the parallel fissure, thus tending to cut off the superficial connection between the third and fourth annectant gyri and the occipital lobe.

On the right side the anterior of these sulci (*a*, fig. 2) is represented by an oblique limb of the parallel sulcus directed backwards and downwards, which joins the inferior longitudinal sulcus at the point where the posterior transverse sulcus (*b*, fig. 2) arises. This point is 9.5 cm. distant from the most anterior extremity of the temporo-sphenoidal lobe. On both sides the posterior sulcus ends blindly, but it is much smaller on the right side.

Tentorial surface of the temporo-sphenoidal and occipital lobes.—The collateral fissure is asymmetrical.

The calcarine fissure, shallow posteriorly, deepens and first joining the internal parieto-occipital fissure then becomes submerged in it. (*Vide* figs. 3 and 4.)

Depending on the rapid junction of the calcarine and internal parieto-occipital fissures the cuneate lobe is very small.

On opening the continuation of the internal parieto-occipital fissure the cuneate lobe is seen to lie submerged in it.

The fact that the uncinate gyrus was decidedly bigger than normal is noticeable. A blind sulcus ran in the anterior part of the uncinate gyrus from before backwards, and thus divided it into an internal and an external portion. (*Vide x*, in figs. 3 and 4.)

Right Hemisphere.

The greatest horizontal external circumference was 8 inches.

From the point where the sulcus of Rolando opened into the longitudinal fissure to the most anterior extremity of the frontal lobe measured 5 inches, while from the former point to the posterior extremity of the occipital lobe the distance was found to be $3\frac{1}{4}$ inches. These measurements are of importance as they roughly indicate what relation the frontal portion of the brain mass bears to the rest, the more acute the angle formed by the two fissures of Rolando opening into the longitudinal fissure the more highly are the frontal lobes developed, and presumably the higher the potential intellectual powers.

The horizontal limb of the Sylvian fissure was $3\frac{1}{4}$ inches in length, while the ascending limb measured 1 inch in length.

The external parieto-occipital fissure is bifurcated at its origin, both its limbs are three-quarters of an inch in length.

Lobes.—Frontal lobe.—The superior middle and inferior frontal gyri are all continuous anteriorly; the transverse arrangement is well shown. Tendency to be four instead of the usual three longitudinal frontal gyri.

There are no connecting bridges of cortical substance superficially.

The ascending frontal gyrus is joined superficially to the superior and inferior frontal gyri, its junction with the middle frontal gyrus is depressed, being deep in the transverse frontal sulcus.

The transverse frontal sulcus, though well developed, does not open into the horizontal limb of the fissure of Sylvius as it often does when well formed.

Orbital surface, an irregular and not very definite tri-radiate sulcus. The arrangement of the gyri is simple.

Parietal lobe.—The interparietal sulcus opens into the horizontal limb of the fissure of Sylvius (12.5 mm. deep at this point). It is not broken across at its anterior superior border by a bridge of cortical substance as it is on the left side.

The ascending parietal gyrus is connected in the operculum to the ascending frontal gyrus, but is quite cut off from the supra-

marginal gyrus by the junction of the interparietal sulcus with the horizontal limb of the fissure of Sylvius.

The postero-parietal lobule is divided into anterior and posterior portions by a sulcus parallel to and 1 inch in front of the external parieto-occipital sulcus (half an inch behind the end of the calloso-marginal sulcus). This sulcus joins the interparietal sulcus. At the bottom of this anomalous sulcus a small gyrus rising to the surface is visible. The postero-parietal lobule is connected by a bridge to the angular gyrus and by the first annectant gyrus to the superior occipital gyrus.

The supra-marginal gyrus is quite cut off from the ascending parietal gyrus by the interparietal sulcus running into the horizontal limb of the fissure of Sylvius. In common with the angular gyrus it is connected with superior temporo-sphenoidal gyrus.

Angular gyrus is more convoluted than the rest of the hemisphere, it is connected to the posterior portion of the postero-parietal lobule, and to the superior but not the middle temporo-sphenoidal gyri.

The place where the second annectant gyrus would naturally come off is injured, owing to the fact that in the recent state there was a large Pacchionian body there, but it does not look as if there had been one there.

From the angular gyrus an isolated tongue of cortical substance, with sulci 8–12 mm. deep on each side of it, runs forward between (a) the connecting gyrus between the superior temporo-sphenoidal and the supra-marginal and angular gyri, and (b) the annectant gyri from the middle and inferior temporo-sphenoidal gyri.

Occipital lobe.—The three gyri are distinct.

Of the annectant gyri the first is well developed, as to the second, owing to injury it is doubtful where it ever existed, the third annectant gyrus has no superficial origin from the middle temporo-sphenoidal gyrus. There is no fourth annectant gyrus.

Temporo-sphenoidal lobe.—The parallel sulcus (*vide* fig. 2) bifurcates posteriorly, and thus encloses what represents the third and fourth annectant gyri, the lower limb of the fissure where it crosses the middle temporo-sphenoidal gyrus is very shallow at first, but deepens (12 mm.) as it approaches the lateral boundary where it joins the inferior temporo-sphenoidal sulcus. Across this shallow limb the middle temporo-sphenoidal gyrus is continuous into the third annectant gyrus.

The third annectant gyrus is almost divided into an anterior and posterior portion by a vertical sulcus (*b*, fig. 2) which starts from the inferior temporo-sphenoidal sulcus at the point where the lower obliquely directed limb of the parallel sulcus joins the inferior temporo-sphenoidal sulcus. This vertical sulcus is 12 mm. in length. [Compare its greater development on the left side.]

Under surface of the temporo-sphenoidal and occipital lobes.—Gyri eminently antero-posterior in direction.

Collateral fissure is broken up by an irregular communicating bridge between the uncinate and inferior temporo-occipital gyri. It does not join the calcarine or the internal parieto-occipital fissures.

Calcarine fissure (*c*, fig. 4) arises posteriorly from a shallow bifurcated origin and runs first into and then becomes submerged in the internal parieto-occipital fissure, so that the internal part of the calcarine fissure does not open on the surface, but into the continuation of the internal parieto-occipital fissure.

The cuneate lobe (*d*, fig. 4) is very small owing to the junction of the calcarine and internal parieto-occipital fissures so close to posterior border of the occipital lobe, its greatest breadth is 12 mm. The cuneate lobe is submerged in the continuation of the internal parieto-occipital fissure. The cuneate lobe ends in a submerged tongue which runs across the continuation of internal parieto-occipital sulcus into the præcuneus.

The anterior part of the uncinate gyrus is divided into two portions, internal and external, by a simple blind sulcus (33 mm. long) which runs in an antero-posterior direction. This sulcus is 12 mm. in depth. This sulcus is marked with *x* in fig. 4.

The inferior occipito-temporal gyrus is more convoluted posteriorly than anteriorly, laterally it is well separated off from the inferior temporo-sphenoidal gyrus by the inferior temporo-sphenoidal sulcus.

Left Hemisphere.

The greatest horizontal circumference externally was $8\frac{1}{4}$ inches, while the maximum height was $3\frac{1}{4}$ inches.

Taking a bird's-eye view of the brain it is seen that the anterior extremity of the frontal lobe is $5\frac{1}{2}$ inches in front of the point where the fissure of Rolando runs into the longitudinal fissure, and that this latter point is $3\frac{3}{4}$ inches distant from the posterior extremity of the occipital lobe.

The fissures.—The horizontal limb of the fissure of Sylvius measured $3\frac{3}{4}$ inches in length, while the ascending limb was half an inch in length, and then bifurcated, at its origin a small portion of the insula was visible.

The external parieto-occipital fissure was bifurcated at its origin.

The interparietal sulcus opened into the horizontal limb of the fissure of Sylvius, it is bridged across at its anterior and superior border by a gyrus which joins the postero-parietal lobule.

The parallel sulcus was far from normal, $2\frac{3}{4}$ inches from the anterior extremity of the temporo-sphenoidal lobe it is joined at right angles by a sulcus (*a*, Pl. II, fig. 1) which arises from the inferior temporo-sphenoidal sulcus. The second and third temporo-sphenoidal gyri are thus separated from the third and fourth annectant gyri. [Compare with so-called bifurcation of parallel fissure on right side.]

From this point the parallel fissure is continued posteriorly for 2 inches, it then bifurcates and tends to cut off the occipital lobe from its third and fourth annectant gyri. At the point of bifurcation the sulcus is deep, the limbs, however, are shallow.

The lobes.—Frontal lobe.—The superior middle and inferior frontal gyri are blended superficially at their anterior extremity, their arrangement is otherwise simple. It may be worth while noting that there is a tendency to four instead of usual three longitudinal gyri.

The ascending frontal gyrus is connected to the superior frontal by a large bridge, and to the inferior frontal gyrus by a small bridge, otherwise it is distinct and is not connected to the middle frontal gyrus.

Orbital surface, smoother than on the right side. The tri-radiate sulcus is fairly distinct.

The parietal lobe.—The ascending parietal gyrus is quite isolated except for two small bridges of cortex which connect it, the one to the ascending frontal gyrus, the other to the postero-parietal lobule.

The postero-parietal lobule is joined by a small bridge to the supra-marginal gyrus. Running transversely into the postero-parietal lobule from the longitudinal fissure is seen a sulcus, which is, however, not so well developed as the one on the right side, it does not run into the interparietal sulcus, and hence the postero-parietal lobule is not divided into two separate halves, anterior and posterior, as is the case on the other side.

The first annectant gyrus is small superficially.

The supra-marginal gyrus is cut off from the ascending parietal gyrus by the interparietal sulcus and is joined to the superior temporo-sphenoidal gyrus by a gyrus (half an inch across). As mentioned above, a gyrus breaks across the interparietal sulcus at its anterior superior border to join the postero-parietal lobule.

The angular gyrus is distinct and is better marked off than on the right side.

The second annectant gyrus is distinct.

In common with the supra-marginal, the angular gyrus is connected to the superior temporo-sphenoidal, but not to the middle temporo-sphenoidal gyrus.

The occipital lobe.—The sulci separating the three gyri are distinct.

Of the annectant gyri the first is small while the second is plainly shown, the first annectant gyrus separates the external parieto-occipital fissure from a sulcus ($1\frac{1}{4}$ inches long) directed transversely outwards.

The third and fourth annectant gyri are almost entirely cut off from the occipital lobe by a vertically directed sulcus (*b*, fig. 1), which arises from the inferior temporo-sphenoidal sulcus at the lateral boundary. This sulcus is prevented running into the posterior portion of the parallel sulcus by a narrow bridge of cortical substance, which is the whole superficial part of the third (and fourth?) annectant gyri.

Temporo-sphenoidal lobe.—The superior temporo-sphenoidal gyrus is continuous with the supra-marginal and angular gyri, at about its centre, the superior temporo-sphenoidal gyrus is cut across by a shallow sulcus which connects the horizontal limb of the fissure of Sylvius and the parallel sulcus described above.

The middle temporo-sphenoidal sulcus, $2\frac{3}{4}$ inches from the anterior extremity of the temporo-sphenoidal lobe; this sulcus is cut across by a vertical sulcus running from the parallel sulcus to the inferior temporo-sphenoidal sulcus. This anomalous sulcus cuts off the middle and inferior temporo-sphenoidal gyri from their natural continuations, the third and fourth annectant gyri (*a*, fig. 1).

At a distance of $1\frac{1}{4}$ inches behind this anomalous sulcus there is a vertical sulcus (*b*, fig. 1) (1 inch in length) which almost entirely cuts off the occipital lobe from the third and fourth annectant gyri (*vide* under occipital lobe).

The inferior temporo-sphenoidal sulcus begins in the anterior of these two anomalous vertical sulci and runs in the lateral boundary to the posterior extremity of the brain.

The under surface of the temporo-sphenoidal and occipital lobes.

—The arrangement of the gyri is eminently antero-posterior in direction.

The collateral fissure bifurcates posteriorly, the internal limb joins the calcarine fissure.

The calcarine fissure (*c*, fig. 3) is bifurcated at its origin posteriorly, it then runs into the internal parieto-occipital fissure and becomes submerged in the continuation of that fissure. The cuneate lobe is very small, its greatest breadth is a quarter of an inch, it is also submerged for part of its extent in the continuation of the internal parieto-occipital fissure. The calcarine fissure is more submerged on this side than on the right side.

The uncinate gyrus is not very easy of definition posteriorly

owing to the fact that the collateral fissure is rather broken up. The uncinate gyrus is distinctly larger than normal, it measured a quarter of an inch more than that of a well developed European brain.

Anteriorly the uncinate gyrus is divided (as on the right side) into an internal and an external portion by a blind sulcus (marked *x*, fig. 3) directed antero-posteriorly. This sulcus (25 mm. long, 6 mm. deep) is not so big as the corresponding one on the right side.

The inferior temporo-occipital gyrus is well defined laterally by the inferior temporo-sphenoidal sulcus.

Depths of Fissures and Sulci.

The fissures and sulci were measured in several places. The number put down is an average. It may be well to say that the term fissure is reserved for the so-called complete sulci, viz., the Sylvian, parieto-occipital, calcarine, collateral, and hippocampal. All the rest are sulci.

				Right hemisphere.	Left hemisphere.
<i>Fissures:</i>					
Sylvian..	..	..	..	16·7 mm.	14·5 mm.
Collateral	..	..	..	9·5	9·4
Calcarine	..	..	..	14·3	12·7
Internal parieto-occipital	..	..	..	17·4	19·0
Hippocampal	..	..	..	7·9	9·5
<i>Sulci:</i>					
Rolando	..	..	..	12·7	12·7
Interparietal	..	..	..	13·7	12·7
Transverse frontal	..	..	..	12·7	13·3
Orbital surface..	..	..	..	7·7	4·6
Parallel..	..	..	..	16·9	15·8
Middle temporo-sphenoidal	..	..	..	9·5	12·7

Explanation of Plate II.

- Fig. 1. Lateral view of left hemisphere of brain of adult male Australian. For explanation of sulci marked *a* and *b* in figs. 1 and 2, see text.
- „ 2. Lateral view of posterior portion of right hemisphere of the same brain.
- „ 3. Tentorial surface of left hemisphere of the same brain.
- „ 4. Tentorial surface of right hemisphere. Reference letters to figs. 3 and 4; *c*, calcarine fissure; *d*, cuneate lobe; *e*, internal parieto-occipital fissure; *x*, an anomalous sulcus described in the text.

The following paper was then read:—

On a FOSSIL HUMAN SKULL from LAGOA SANTA, BRAZIL.

By SÖREN HANSEN.

Abstract.

THE author gives good reason for believing that the skull in question, now in the Geological Department of the Natural History Section of the British Museum, having formed part of a collection purchased in 1844 from M. Chaussen, was originally in the possession of Lund, and is one of a large series obtained by that explorer in the cave known as Lapa di Lagoa di Sumadouro, the remainder of which are in the Copenhagen Museum. As the contents of this cave are much mixed, the age of any individual specimen found in it can not be determined with precision, but the author believes that this skull was contemporaneous with the now extinct mammalian fauna of the country. It has the same elongated form and general characters of the other Lagoa Santa skulls, characters which are repeated in the Botokudos, more nearly than in any other existing race.

MARCH 8TH, 1887.

FRANCIS GALTON, Esq., F.R.S., *President, in the Chair.*

The Minutes of the last ordinary meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—*Social History of the Races of Mankind.*
Second Division. Papuo and Malayo Melanesians. By A.
Featherman.

— Annual Address to the Asiatic Society, Calcutta, February
2, 1887. By the President, E. T. Atkinson, B.A.

From the GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA.—
Annual Report, 1885.

From the ESSEX FIELD CLUB.—*Transactions.* Vol. iv, Part 2.

— *The Essex Naturalist.* Nos. 1, 2.

From the ASSOCIATION.—*Journal of the East India Association.*
Vol. xix, No. 2.

- From the SOCIETY.—Journal of the Society of Arts. Nos. 1788-9.
 — Proceedings of the Royal Geographical Society. March, 1887.
 — Proceedings of the Asiatic Society of Bengal. 1886. Nos. 8, 9.
 — Journal of the Asiatic Society of Bengal. Nos. 271, 272.
 From the EDITOR.—Nature. Nos. 904, 905.
 — Science. No. 211.
 — Photographic Times. Nos. 283, 284.
 — Scientific News. Vol. I, No. 1.
 — Kosmos. Vol. I, No. 1.

The following paper was read by the author:—

STONE CIRCLES *near* ABERDEEN.

By A. L. LEWIS, F.C.A., M.A.I.

[WITH PLATE III.]

THE comparatively flat part of Scotland, which forms its most easterly angle, and is chiefly included in the county of Aberdeen, has, up to a recent period, contained a great number of stone circles, no less than twelve having existed within the memory of man in the one parish of Old Deer, in the corner of the angle already mentioned, about twenty miles north from Aberdeen, and within a dozen miles of the sea. Many, however, which remained so recently as to be marked on the ordnance map, have now disappeared; amongst them one which formerly stood on the Burgh Muir of Inverurie, about sixteen miles north-west from Aberdeen.¹

There is a fine circle remaining at Tyrebaggar Hill, two miles from Dyce junction, and six or eight north-west from Aberdeen; it is 57 feet in diameter, and consists of eleven upright stones varying in height from $2\frac{1}{2}$ to $9\frac{1}{2}$ feet, standing on a bank of earth and stones, $2\frac{1}{2}$ feet high, and 3 or 4 wide at the narrowest part; the two tallest stones are on the south side of the circle, and between them is a stone, 10 feet or more long, $6\frac{1}{2}$ high, and 2 thick, which leans inwards, but had planted round it a number of small stones, 2 or 3 feet long, and a foot or so square, as if to hold it in its place. The group formed by this stone with its little supporters and the two high stones, one on each side of it, is obviously the principal feature of the circle, and a line taken almost due north from its centre cuts through the centre of the

¹ I mention this to prevent others from making a useless journey.

circle and between two small stones set on the inner face of the bank to a single stone which is the most northerly of those forming the circle; of the other upright stones, three stand at irregular intervals forming the west side of the circle, gradually diminishing in size towards the north, and three in somewhat similar positions forming the east side; but, besides these latter three, there are, in the eastern half of the circumference, two other small stones, standing close together in such a position that a line taken from the front of the centre of the principal stone due north-east would pass between them; there is a tumulus about 375 feet away in this direction, but not, it would seem, in the exact line. Mr. McCombie Stewart, the station-master at Dyce, who should be consulted by any one visiting Dyce for scientific purposes, informed me that there was formerly a hole in the middle of the circle, which might be suggestive of the former existence of a kist; he also told me that there was supposed to be iron in the largest stones, and this seems very probable, for, on working my rough plans out at home, I found a disagreement in the compass-bearings. In this emergency I applied to Mr. McCombie Stewart, sending him a plan and asking him to verify my compass-bearings and some other particulars. He was so kind as not only to do this, but to get one of the Engineers of the railway to make an exact plan of the circle, showing the bearing of each stone from the centre. I am happy to be able to say, as showing the accuracy of my own methods, that my plan superposed upon his gave practically the same results.

In the letter accompanying the plan, Mr. McCombie Stewart, who is qualified to speak as a geologist, says, "We were unable to account for the peculiar ringing sound of the altar stone, unless it be caused by the flat shape of the stone, having its side firmly fixed in the ground, and the projecting part having a certain vibration—or if it were from the hard *heathen* substance of an iron nature—but one thing is certain, the stone is not of the same nature as those belonging to the neighbouring quarry." I may here mention that Mr. John Stuart¹ says of a similar circle at Ardoyne, Aberdeenshire (now nearly destroyed), that the oblong stone and the two upright stones flanking it were of Bennachie granite, while the rest of the stones were of gneiss. Here are two more instances of the custom of selecting stones from some other locality for the principal stones of a circle. Returning to the Dyce circle I ought to mention that there are two or three small stones (say 3 feet \times 2 feet \times 2 feet) in a plantation to the south-east, but whether thrown down from the

¹ "Sculptured Stones of Scotland" (Spalding Club).

circle or not, I cannot say. A cairn in the field to the north-east was, Mr. McCombie Stewart says, removed in 1886.

Mr. Christian Maclagan, in his "*Hill-forts, Stone Circles, &c., of Ancient Scotland*," published in large quarto at Edinburgh in 1875, gives a plan of the Dyce circle, which shows an inner circle of small stones close together, of which the two that I have mentioned were doubtless a part. He also shows three stones outside the larger circle, as though forming part of an outer concentric circle, they are probably those which I have mentioned as being in a plantation to the south-east, but I do not think there was any circle surrounding that which now exists. Mr. Maclagan's book appears to have been published at considerable expense to support a view of which he probably has a monopoly, namely, that all stone circles are the last remains of circular buildings of unmortared masonry of the *broch* type, and that the banks of small stones in which the upright ones are set and held fast are only the remains of foundations. He also thinks that the oblong stones have in every case been laid flat on the short pillars surrounding them, and have been the lintels of entrances, and he delineates a "restoration" of a circle at Aquhorthies, near Inverurie, showing the oblong stone in this position with a huge mass of uncemented masonry resting upon it. There can, however, be little doubt that all these oblong stones were originally set upright on edge, and that where they lean or are flat it is because they have slipped. Mr. Maclagan speaks of them as "south-west stones," whereas they are not at the south-west, but at the south of the circles—perhaps he forgot the westerly variation of the compass. Mr. Maclagan considers his theory to apply to Stonehenge, which he figures "restored" with an enormous tower embedding and surmounting it, and to Avebury, the great circle of which, 1,300 feet in diameter, he takes to have been the last remains of an immense circular wall, larger than the bank which still surrounds the site, and which is as large as a railway embankment. The utter improbability of the entire disappearance (especially in places where stones are a nuisance) of such tremendous quantities as Mr. Maclagan suggests the former existence of might, but for his nationality, lead us to suppose that in propounding his theory he was perpetrating a practical joke almost as heavy as his masses of masonry would have been had they ever existed; at the same time, it may be admitted that some very small circles may possibly have had some such origin as he suggests. It is a great but common mistake to assume that all circular arrangements of stones must necessarily have had the same origin and use.

About six miles south from Aberdeen and two west from

Portlethen station, four circles are marked on the ordnance map—two on each side of the hill of Auchorthies. These four circles were described in the "Proceedings of the Society of Antiquaries of Scotland" (June, 1863, Vol. V, page 130), by Mr. Alexander Thomson, who, with some others, dug inside them on 30th September, 1858. Of the most northerly of these circles—the Badentoy circle—four stones remain in the middle of a field, a wall has been built round them, no doubt from the fragments of other stones belonging to the circle, a mode of preserving rude stone monuments which, however well-intentioned, does not commend itself to the archaeologist. I should not be surprised if these four stones have themselves been removed inwards from their original position, since they now stand at the four cardinal points *by compass* from a central point, the distance between the north and south pair being only 28 feet, and that between the east and west pair only 24 feet, the diameter of a small inner circle, for which 3 feet stones were generally used, while these stones are from 4 to 7 feet high, the size of those used for outer circles. Mr. Thomson, indeed, says that he found only three stones standing, and it would seem, on a comparison of the measurements he gives, that the most northerly stone (which is the smallest and most untruly placed) has been put in its present position, and the wall built since he visited it (perhaps in 1865, when the ordnance survey was made). Mr. Thomson found that this circle had been excavated before, some half-calcined bones and morsels of wood charcoal being left. The second circle from the north—the "King-causie" circle—appears to have been entirely destroyed, two or three very small stones and some heaps of fragments, which may perhaps have belonged to it, only excepted. In 1858, Mr. Thomson found here three concentric rings of small stones from 2 to 3 feet high, the outer circle 70 feet, the middle circle 56 feet, and the inner circle 12 feet in diameter. The latter was found upon digging to be full of black mould, fragments of bones, and wood charcoal, and in five places fragments of coarse earthenware vases. As he says this circle was so inconspicuous that one might pass within a few yards of it without noticing it, it is possible that I did not get to the right spot, and that there may be more of it left than I have said. Of the most southerly circle—the Bourtreebush circle—four stones remain upright and four prostrate, besides quantities of very small fragments, the stones which remain are about the same size as those at Dyce, and the diameter of the circle would appear to have been about 90 feet. Of these four circles (which do not seem to have had any connection with each other) only the second from the south—the Auchorthies circle—is in such preservation that its

plan can be clearly made out, and of this bad weather and want of time prevented my taking fully detailed measurements. I am able, however, to say that, like the Dyce circle, it has an oblong stone (9 feet long, by 4 feet high, by $1\frac{1}{2}$ feet thick), standing on edge at the south side, facing a trifle west of true north, which had an upright stone on each side, one of these remains, and the hole in which the other stood is plainly visible. The circle was formed of perhaps a dozen other stones, none of which were more than 6 feet high, its diameter seems to have been 65 feet from north to south, and 76 from east to west. There was a second circle about 12 feet inside the outer one, it consisted of stones measuring on the average 3 feet high by 3 feet by 1 foot, and standing close together. Close to the centre of these concentric circles and in the direct north and south line are three small stones (2 feet high by $1\frac{1}{4}$ foot by 1 foot) close together, perhaps forming part of a small interior circle or kist. The ground inside all these three circles is a foot or two higher than that outside. Mr. John Stuart says that in one of them a kist, 3 feet long and $1\frac{1}{2}$ wide, containing ashes, was dug up between the outer and second circles. This, however, was obviously a mere casual interment.

The two last-mentioned circles do not appear to have been much interfered with since Mr. Thomson explored them in 1858. He does not seem to have found anything in the Bourtreebush circle, but on turning up the area of the innermost circle at Auchorthies, he found charcoal, half-calcined bones, black unctuous earth, and small fragments of a vase, and he was told someone had dug there fifteen years previously and found nothing.

Mr. Maclagan seems to me to have mixed up his recollections and sketches of the circles at Aquhorthies, near Inverurie, and Auchorthies, near Aberdeen, which latter I have just been describing, and he says of the most southerly circle at Auchorthies, that Chalmers at the beginning of the century found sixteen stones, but that he himself going in 1873 found only one, but saw the places where the other fifteen had been, each with a little heap of stones round it, and argues from this the great rapidity with which these monuments have been destroyed, and the probability of the removal of his imaginary masses of masonry within the historic period. I, going in 1885, however, found, as I have said, four stones upright and four fallen, so that I cannot but think that Mr. Maclagan must have missed this circle, and found his way instead to a standing stone shown on the ordnance map about half a mile further south. Moreover, though Chalmers gives the description attributed to him, he quotes it (with acknowledgment) from a much older one, which I am now about to quote also.

A letter from the Reverend Dr. James Garden, Professor of Theology in the King's College of Aberdeen, to — Aubrey, Esquire, which contained, amongst other things, a description of the two circles last referred to, was read before the Society of Antiquaries of London, on the 4th December, 1766,¹ and from it I have made the following extracts:—

"Honoured Sir,

"Yours dated at London, April 9th, 1692, came to my hands about ten days after."²

"What the Lord Yester and Sir Robert Morray told you long ago is true, viz., that in the north parts of this kingdom many monuments of the nature and fashion described by you are yet extant. They consist of tall, big, unpolished stones set upon end and placed circularly, not contiguous together but at some distances; the obscurer sort (which are the more numerous) have but one circle of stones standing at equal distances; others towards the south or south-east have a larger broad stone standing on edge, which fills up the whole space between two of those stones that stand on end, and is called by the vulgar the altar stone; a third sort more remarkable than any of the former (besides all that I have already mentioned) have another circle of smaller stones standing inside the circle of the great stones; the area of the three sorts is commonly (not always) filled with stones of sundry sizes confusedly cast together in a heap. Two of the largest and most remarkable of these monuments that ever I saw are yet to be seen at a place called Auchincorthie, in the shire of Merris, 5 miles distant from Aberdeen,³ one of which has two circles of stones, whereof the exterior circle consists of thirteen great stones (besides two that are fallen and the broad stone toward the south) about 3 yards high above ground, and 7 or 8 paces distant one from another, the diameter being 24 large paces; the interior circle is about 3 paces distant from the other, and the stones thereof 3 feet high above ground.⁴ Toward the east from this monument, at

¹ *Archæologia*, Vol. 1, page 312.

² I am informed by Professor Geddes, of the University of Aberdeen, that the Rev. Dr. James Garden was Professor of Divinity there from 1681 until he was dismissed for refusing to submit to William III, and that his successor was installed in 1698.—A. L. L.

³ "Merris" is Mearns or Kincardine. Chalmers, quoting this account in "*Caledonia*," says that Achen-corthie signifies the "field of the circles," on the ordnance map it is called Auchorthies, and I find there is also a place called Aquhorthies, near Inverury, where a circle still exists, or did till very lately. Gough, in his edition of Camden's *Britannia*, 1806, also quotes this account, but both authors have committed errors in transcribing and abridging it.—A. L. L.

⁴ This is apparently the most southerly of the four circles I mentioned, which is now nearly destroyed; and this old description is therefore very valuable, not only as showing what it was like, but also that it was like the others; Dr. Garden however understates the diameter, as a comparison of his own figures shows.—A. L. L.

26 paces distance, there is a big stone, fast in the ground and level with it, in which there is a cavity, partly natural and partly artificial, that will contain, as I guess, no less than a Scotch gallon of water, and may be supposed to have served for washing the priests, sacrifices, and other things esteemed sacred among the heathen. The other monument, which is full as large if not larger than that which I have already described, and distant from it about a bowshot of ground, consists of three circles having the same common centre; the stones of the greatest circle are about 3 yards, and those of the two lesser circles 3 feet, high above the ground, the innermost circle 3 paces diameter, and the stones standing close together. One of the stones of the largest circle on the east side of the monument hath upon the top of it (which is but narrow and longer one way than the other) a hollowness, about 3 inches deep, in the bottom whereof is cut out a trough, 1 inch deep and 2 inches broad (with another short one crossing it) that runs along the whole length of the cavity and down by the side of the stone a good way, so that whatsoever liquid is poured into the cavity upon the top of the stone doth presently run down the side of it by this trough, and it would seem that upon this stone they poured forth their *libamina* or liquid sacrifices; there is also another stone in the same circle and upon the same side of the monument (standing nearest to the broad stone that stands on edge and looks toward the south) which hath a cavity on the upper end of it, it is considerably lower on one side and will contain about one English pint, at the first sight it seemed to me to have been made for burning a lamp, but, when I considered that it was *sub dio*, I found it could not be for that use, afterwards observing it more narrowly I perceived that it was cut after the fashion of the cavity in the other stone already described, albeit not so clearly and distinctly, and that there is a natural fissure in the stone by which all the liquor poured into the cavity runs out of it down by the side of the stone to the ground.¹

“The general tradition throughout this kingdom concerning these kind of monuments is that they were places of worship and sacrifice in heathen times, few of them have particular names. In this part of the country they are commonly called *standing*

¹ The next stone to the broad stone is usually one of the highest in the circle, and according to the Rev. Dr. would have been three yards high, in which case he would hardly have seen the cavity at the top. This description in every other respect agrees with the second circle from the south, where the highest stone now remaining is six feet high, so that an error has evidently been committed, either in his original letter or in copying it. The stone next to the altar stone on the east has now been removed, but its fellow is about five feet high.—A. L. L.

stones, and in the Highlands of Scotland, where the Irish tongue is spoken, they call them *caer*, which signifies a throne, an oracle, or a place of address, as I am informed by a judicious person here, who understands that language, and was lately in those parts where, he says, they have such a superstitious veneration for these monuments that they will not meddle with any of their stones or apply them to another use; and being lately at Auchincorthie, I was told that a poor man who lives there having taken a stone away from one of the neighbouring monuments above described and put it into his hearth was, by his own relation, troubled with a deal of noise and din about his house in the night time until he carried back the stone unto the place where he found it.¹

"Some of them are called chapels . . . others are called temples . . . and those two whereof I have given you a particular description are called by the people that live near by 'Law Stones,' for what reason I know not, and 'Temple Stones.'² They have a tradition that the pagan priests of old dwelt in that place, Auchincorthie, and there are yet to be seen at a little distance from one of the monuments standing there the foundations of an old house which is said to have been their Teind Barn; they report likewise that the priests caused earth to be brought from other adjacent places upon people's backs to Auchincorthie for making the soil thereof deeper, which is given for the reason why this parcel of land, though surrounded with heath and moss on all sides is better and more fertile than other places thereabouts.³ All these names (except the first) confirm the general tradition concerning these monuments, that they were places of worship, and some of them, as that of the 'temple' and 'temple stones,' declare that they have not been erected by Christians, or for their use, which their structure also doth sufficiently demonstrate besides. . . . Old Aberdeen, 15th June, 1692."

¹ It is much to be wished that all destroyers of rude stone monuments and especially those of Avebury, had been plagued in the like or some worse manner, and, if the Welsh bards who are coming to London this year have had handed down to them any particularly awful Druidic form of curse, warranted to wear in the next world as well as in this, I would suggest that they should immediately put it in force against all circle-destroyers, past, present, or future. This superstition would, however, have assisted to prevent the removal of Mr. Mac-lagan's imaginary masses of masonry, and therefore diminishes the very slight possibility of their ever having existed.—A. L. L.

² The editor of *Archæologia* notes to this:—"From barrows and heaps of stones being intended for sepulchres they are called Lows in Staffordshire (and he might have added Derbyshire) and Lawes in Ireland," (*Antiq. Corn.*, 1st Ed., p. 200).

³ This tradition, which seems rather absurd at first sight, may have arisen from the custom which we know to have prevailed of bringing earth and stones from a distance to form special parts of tumuli and circles.—A.L.L.

This date and these last sentences are of the very greatest importance for this reason :—Mr. John Stuart and other writers of what I may call the anti-Druidic school have advanced the propositions that “the theory which ascribes to stone circles the purpose of temples or courts is modern and unsupported by facts.” “In the seventeenth century a theory was proposed by two English writers, John Aubrey and William Stukeley, which ascribed the great circles of Stonehenge and Avebury to the Druids as their temples, and since their day all stone circles have been called Druidical circles.”¹ These propositions must, however, be now and for ever abandoned in view of the proof contained in this letter, printed in *Archæologia* 120 years ago, but written nearly 200 years ago to Aubrey himself, who was the earlier of the two writers (for Stukeley lived not in the seventeenth but in the eighteenth century), that at that time the “general tradition” concerning the Scotch circles was that they were “places of worship and sacrifice in heathen times.”

It is true Dr. Garden uses the word priest instead of Druid, and says that he finds no mention of Druids, but he himself evidently looks upon the priests in question as Druids, and we know from other sources that the Druids were the priests of the Celts and would tolerate no rivals.

In former papers on stone circles I have insisted very strongly on the presence of a special reference to the north-east, and have drawn various conclusions therefrom, but, as regards the two comparatively perfect circles I have described (although in the Dyce circle there is an indication of a north-easterly reference) the main direction is north and south, and not north-east and south-west; if this were the only difference between these circles and those of southern Britain it might fairly be said that what I had previously pointed out about the north-east was a mere collection of accidental coincidences, but there is another most palpable difference which, when brought to notice, cannot fail to strike the most casual observer; the oblong stone, flanked by two upright stones, which is the principal feature in these circles appears, so far as I have yet been able to discover, nowhere except in the Aberdeen district, where on the other hand it is almost universal. It is true that, though I visited six sites, I only found two circles sufficiently well preserved to draw any conclusions from, but I am fortunately not entirely dependent on my own observation. The Rev. James Peter, Incumbent of Old Deer, read a paper on the subject before the Anthropological

¹ Transactions of International Congress of Prehistoric Archæology, 1868, and Sculptured Stones of Scotland, Vol. 2.









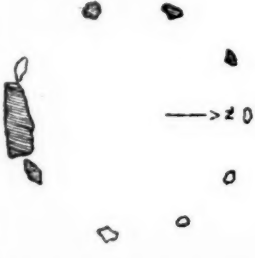


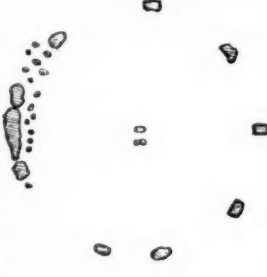
Section of the British Association at Aberdeen, at which I was present; the substance of this paper is published with plans and illustrations in the Proceedings of the Society of Antiquaries of Scotland, 1884-5, and I exhibit tracings from those plans and illustrations, showing this arrangement of one oblong and two upright stones in three circles, and from the illustrations to Col. Forbes Leslie's "*Early Races of Scotland*," showing the same arrangement in three other circles and from Mr. Maclagan's book before quoted showing it in four other circles which, added to the two I have myself described to you, make twelve circles in which I can prove pictorially that the oblong stone with its two supporters occurs, though, as a matter of fact, it has been much more general. Mr. Peter stated that in fifteen circles he was acquainted with, the "altar," as this oblong stone is popularly called, was at the south, and that in two circles it faced north-east; at the Strichen circle the "altar" is at the north instead of the south, and at Sinhinny it appears to be at the west; at the "White Cow Wood" circle there is no "altar," but the largest stones are at the south and a dolmen occupies the north-east corner of the circle. It is, however, clear that the "altar" and its supporters were prominent in most of the circles of the Aberdeen district, but I cannot find, either from friends of whom I have enquired, or from books which I have consulted, that they occur anywhere else; even in what I may call the Inverness district, not fifty miles distant, but divided from the Aberdeen district in places by mountains more than four thousand feet high, it seems that, though there are concentric circles, there are no "altars."¹

The circle in England which, as I think, most resembles those near Aberdeen and Inverness is that at Gunnerkeld in Westmoreland, described by me in the "*Journal of the Anthropological Institute*" (November, 1885, Vol. XV, page 167), and pronounced by Mr. Dymond and myself to be in all probability a tomb rather than a temple, but it has nothing like an "altar" stone. Certain structures known as "*Giant's Graves*" in the north of Ireland, and described by Dr. Sinclair Holden in "*Anthropologia*," had some points of resemblance in principle, but still more of difference in form; they consisted of a long covered burial chamber running from north-east to south-west with a separate covered niche, open to the air and facing outwards at the south-west end of it, which might have been a sort of altar place; these were surrounded by an oblong wall of stones forming a promenade round the chamber, like that between the outer

¹ See for example Mr. Fraser's "*Descriptive Notes on Stone Circles of Strathnairn and neighbourhood of Inverness*," in *Proceedings of Society of Antiquaries, Scotland*, 12th May, 1884.

and inner circles in Scotland, and Dr. Sinclair Holden remarks that the covered niche never occurs without this surrounding wall of stone; notwithstanding the difference in shape, therefore, I am inclined to regard the Aberdeen circles as having more affinity to the "Giant's Graves" than to the English circles to which it has always been sought to ally them. Considering the relative position of this part of Scotland it might have been thought that the Aberdeen circles and "altars" had been constructed under a Norwegian influence, but I cannot find that any such arrangement of stones exists in any part of Scandinavia; it may be that this peculiar form of circle was developed by some tribe or tribes cut off from the rest of the world by the sea, the mountains, and hostile populations; certain it is that different countries have their specialities in rude stone monuments as in other things, and that the use of unhewn stones is no proof of the intercourse or common origin of the users unless they be used in some more markedly similar manner than a mere placing of them in circles. In the oblong "altar" stone, flanked by two upright stones we have a very obvious difference, which, combined with the absence of any such marked reference to the north-east as exists in the circles of southern Britain, might almost lead us to suppose that the circles of the two countries were constructed by a different set of people, and perhaps for a different purpose, but I am not aware that this has been previously pointed out, most writers seeming rather to dwell upon the points of resemblance between the circles of all countries. From their great number and close contiguity, and from remains found in them,¹ it might seem more likely in the case of the Aberdeen circles than in that of most English circles that their primary object was sepulchral, but the traditions already mentioned and the avenue between the inner and outer circles are suggestive of periodical processional or other rites culminating in some special observance before the so-called "altar" stones. Mr. John Stuart and Mr. Fergusson, though differing as to their date and origin, both maintain the Scotch circles to have been purely sepulchral, ignoring the common and, as I have shown, long-standing traditions concerning them, and, having established this to their own satisfaction, and finding in southern Britain other circles, with differences of construction of which they take no notice, they conclude that

² See list in "Sculptured Stones of Scotland," edited by John Stuart, Esq., for the Spalding Club. With special regard to the number and contiguity however Colonel Forbes Leslie says "several stone circles, close together, even intersecting each other, and lately erected to the same object of worship—viz., to Vital—may any day be seen in secluded rocky places near towns and villages of the Dekhan in India. Near Poona they are extremely common."—"Early Races of Scotland," page 214.

 STRICHEN. (Rev. J. Peter)	 MIDMAR. (Col. Forbes Leslie)	 ARDLAIRE. (Col. Forbes Leslie)	 SINHINNY. (Col. Forbes Leslie)
 LOUDON WOOD. (Rev. J. Peter)	 "KIRK O' TOUCH." (C. MacLagan)	 "KIRK O' KEIG." (C. MacLagan)	 AUORTHIES. (C. MacLagan)
 AIKIE BRAE. (Rev. J. Peter)	 AUORTHIES. (A. L. Leslie)	 DYCE. (A. L. Leslie)	 OLD RAYNE. (C. MacLagan)

SKETCHES AND PLANS OF
 "ALTAR STONES" IN SCOTCH CIRCLES
 (ABERDEEN DISTRICT.)

those circles also must be purely sepulchral, Mr. Stuart, in particular, saying that unless some other difference than that of size can be shown to exist he must decline to admit any difference of purpose. I have now shown two other differences to exist between the circles near Aberdeen and those of England and Wales, namely, the oblong "altar" stone at the south, present in the Aberdeen district but absent in England and Wales, and the north-easterly references, indicative of sun-worship, and sometimes of mountain and phallic worship, which are prominent in England and Wales, but only subsidiary in the Aberdeen district.

Explanation of Plate III.

Two plans and ten sketches of "Altar Stones," showing the arrangement of an oblong stone with two supporters peculiar to the Aberdeen district, copied from illustrations to Mr. Maclagan's "Hill Forts, Stone Circles, &c., of Ancient Scotland;" to Colonel Forbes Leslie's "Early Races of Scotland;" to Rev. J. Peters' paper in the Proceedings of the Society of Antiquaries of Scotland; and from original sketches by the author.

DISCUSSION.

Dr. JOHN EVANS complimented Mr. Lewis on the care he had bestowed in examining and describing these Scottish monuments. There were, he thought, two points especially worthy of notice. One, the presence of stones of a kind that must have been brought from a distance, and that were used for the so-called "altar stones." Analogies in this respect might be found among southern stone circles. The second point was the extent of the destruction of these stone circles within comparatively recent times. He suggested that the attention of General Pitt Rivers, as the Inspector of Ancient Monuments, should be called to these Aberdeenshire circles. As an illustration of the employment of concentric circles in places of worship, he mentioned the church of San Stefano at Rome, which is of early date, and the arrangement of which in three concentric circles may have been suggested by some far earlier monument. He regarded the question as to whether the Scottish priests referred to by the author were Druids or not, as involving many difficulties which could not be summarily discussed.

Miss BUCKLAND inquired whether Mr. Lewis had found any cup-markings or basin-like hollows in the stones he had examined, especially on the so-called "altar stones." Referring to the position of the circles as regards the cardinal points, Miss Buckland called Mr. Lewis's attention to the abstract of Mr. Peter's paper read at the Aberdeen meeting of the British Association, in which, according to the author, there would seem to be a special arrangement of

the "altar stone" on the south meridian in fourteen cases out of seventeen, whilst in the three exceptions it faces north-east, and of one circle Mr. Peter proved by measurements that the table stone of the dolmen standing in the centre was so placed as to face the point of the horizon in which the sun rises on Midsummer day.

Dr. GARSON remarked in reference to the observations that Mr. Lewis had made regarding the stones comprising the circles in Aberdeenshire not being obtained apparently from the neighbourhood of the circle, that the stones composing the circle of Stennis, in the Orkney Islands, appear to have been brought from a quarry situated in the hills between Quoyloo and Marwick, about eight miles or more distant. In that quarry there are several stones lying on their sides corresponding closely in size and form to those of the circle. There is no quarry near the circle known from which they could be taken. The question naturally arises how the erectors of these ancient circles, with probably only rude mechanical appliances at their disposal, managed to transport these large stones, which frequently measure from 18 to 20 feet long, by 3 to 4 feet broad, and 9 inches to a foot thick, so great a distance over rough hilly ground to their present resting place.

Mr. BOUVÉRIE-PUSEY remarked that he was much surprised that the author of the paper seemed to countenance the idea that stone circles had something to do with the Druids. We had long and detailed notices of the Druids and of their customs in ancient authors with no mention of stone circles, too characteristic a feature surely to be omitted, and he believed that the notices of Druidism found in the old literature of Ireland were equally silent on this point. It was his opinion that if stone circles were temples at all they must have been the temples of some pre-historic period.

Mr. HYDE CLARKE, after stating that it was by such investigations as those of Mr. Lewis that certain data would be obtained for the determination of the epoch and purposes of the monuments, observed that it was assumed the stones in a circle must be stationed equally. He thought it well worthy of consideration whether intervals were not to be found as in pre-historic and existing arrangements throughout the world. In the plans before them the numbers were twelve, thirteen, sixteen and twenty, numbers commonly found. Now in a circle of twelve it might happen that it was divided three, four and five, or six and six, or seven and five. It was possible that the stones of the Giant's Grave were to be taken not as thirteen, but as twenty-six, or twice thirteen. He should like to see some facts that Celts or Druids had anything to do with the stone monuments otherwise than making burials in them. Aberdeenshire had traces of Iberian occupation.

Mr. LEWIS said in reply to Miss Buckland that he had not noticed any cup-markings or hollows in any of the stones, but it was possible some might have escaped his observation; he thought, however, the cavities described so minutely by Dr. Garden were

very likely natural weatherings. Referring to Dr. Hyde Clarke's suggestion he had, he said, at different times considered the number and arrangement of stones in circles, but had never been able to formulate any rule, or come to any satisfactory conclusion. He thought it not unlikely that the erection of stone monuments was begun by a pre-Celtic race, but the evidence of the objects found in them showed that they had been used and he believed constructed down to if not beyond the commencement of the Roman occupation. It was perhaps, surprising that the traditions mentioned by Dr. Garden, and similar though fainter traditions in other places, should have survived, as they must have done, for more than a thousand years: but to suppose that they had been handed down as traditions from a pre-Celtic period, say three thousand years ago, was surely too much to ask anyone to believe. There was no doubt a want of direct evidence as to the use of stone monuments by the Druids, but that proved nothing, and he thought that such evidence as they had showed that the stone monuments were used by the Celts with the approval of their Druidic priesthood. The question of the transport of large stones had been dealt with by him in a paper on the "Devil's Arrows" published in the *Journal of the Institute* in November, 1878. He was much indebted to Dr. Evans for the reference to the church of San Stefano at Rome.

On PALÆOLITHIC IMPLEMENTS from the DRIFT GRAVELS of the SINGRAULI BASIN, SOUTH MIRZAPORE.

By J. COCKBURN, Esq.

DURING Christmas week, 1883, I was partially rewarded for a long and tedious journey in a country without water and without roads, by discovering a locality where palæolithic implements abounded. So numerous were they that I collected in three days five hundred implements, besides a vast collection of rude flakes and spalls amounting in all to twelve sack loads.

The implements themselves are undistinguishable from those found by Messrs. Foote and King in the laterite of the North Arcot district in Madras; those by Mr. Hacket in the Narbadda gravels; those of Mr. W. T. Blanford from Hyderabad; and those of Mr. Ball from Orissa. They, however, differ in being composed of a great variety of rocks, while all those hitherto found were either quartzite or vein quartz.

The majority of the implements in the Hinouttee locality were found on undulating ground, covered with shingle, over a frontage of a mile and a half along the south bank of the Balliah Nadi. The width of the exposed surface of Talchirs along this frontage varies from a quarter to half a mile, and between the villages of Hinouttee and Amaharee.

The first implement was discovered where the main track to the corundrum mines of Pipra crosses the Balliah Nadi.

Here it lay on the denuded surface of black Talchir needle shales, mingled with shingle, boulders, and other *débris* of what was once a gravel bed. The majority of the specimens were found in these positions.

Here and there the Talchirs have been cut into shallow ravines and the sides and bottoms of all gullies are strewn and often piled with heaps of boulders and shingle.

These boulders present a remarkable variety of colour, green,¹ white, red, purple, and black predominating. The Talchir boulder bed is also exposed at most points, and the coloured boulders and gravel in question have been partly derived from the decomposition of the needle shales in which the boulders are embedded and partly from a superincumbent gravel bed to be described further on.

This gravel bed has yielded implements from Hinouttee to Mahree² on the Bichee Nadi, or over a strip of country twelve miles long from east to west, and four miles broad.

A slight sketch of the physical character of the country will here be necessary.

The Singrauli Basin in South Mirzapore is the only locality in the North-West Provinces where rocks of the Gondwana system occur.

Like other such areas it may be described as a basin-shaped depression in older metamorphic rocks (gneiss and jasperous quartzites) occupied by Talchir and Damuda formations, but the latter in British Singrauli have been almost entirely removed by denudation except six or eight miles of a range which forms the north-west boundary of this corner of Singrauli, extending from Aundhi Hill, lat. $24^{\circ} 12' 21''$, long. $82^{\circ} 43' 51''$, to Kota Puchum.

This range is composed of a characteristic soft, gritty sandstone, Barakar, which occasionally passes into a feeble conglomerate containing oval white and green quartz pebbles from half an inch to two and a half inches in diameter.

It is largely worked into millstones by aboriginal Bhuyars³ who block the stones into shape with small iron axes.

The cultivated portion of Singrauli forms an alluvial depressed plain, on the margin of a great coal basin, about 12 miles long and four in width. The alluvium is for the most part modified

¹ No marks of polishing or scratching were noticed on the boulders from the Talchir boulder bed, although I disinterred several boulders on purpose, and carefully examined them.

² No more than half a dozen specimens were found at Mahree.

³ Some of the Bhuyars have a close resemblance to Australian aborigines in feature and form of skull. But here and there individuals with Aryan features were noticed. These people continue to use bows and poisoned arrows.

regur under rice. Except in ravines in the vicinity of the Reyr River, this alluvium is no where thick, and may be said to uniformly overlies a compact Talchir sandstone. I had exceptional opportunities for testing the depth of this alluvium at points where no exposures occur, owing to the official enquiries I was required to make regarding wells. The alluvium varies from eight to 20 feet in depth at various points between Hinouttee and Mahree, and while the Talchir sandstone forms a stratum nearly impervious to water, it is a serious obstacle to well-sinking. The wells only contain from three to four and half feet of water but this supply is pretty constant.

In ravines in the vicinity of Gharwar Gaon the alluvium is in places 50 feet thick; clay cliffs 30 feet high occur. Below one such cliff I obtained the fossil tibia and portions of the femur of the left pelvic limb of a large *Bos*. These bones were undistinguishable from those of an adult male *Bos gaurus*, with which I compared them in the Indian Museum.

As might be expected from the shallowness of the alluvium, the minor streams in this tract have cut their way into the Talchir rocks. Beautiful exposures of the glacial boulder bed occur at various points, and pot holes are as usual common. As a stream approaches the Reyr it cuts deep, narrow rifts into the Talchir sandstone, full of pellucid water. When still closer to the Reyr, as the declivity increases, gneiss takes the place of the Talchir, which is nowhere thick. Throughout the alluvial basin of Singrauli, wherever cut into by watercourses or streams, a well-defined gravel bed, from a foot to three feet in thickness is found at the base of the alluvium, resting immediately upon the Talchir rocks.

This is the implement-bearing gravel bed, or specimen drift, the subject of this paper. The village of Mahree, in the vicinity of the Bichee Nadi, forms the extreme eastern point where the implements have been obtained, while Hinouttee forms the extreme western point. In places the gravel bed is reduced to a mere string of pebbles, occasionally, even when 18 inches thick, and exposed for 25 or 80 feet, I have failed to obtain *conclusive* fragments of human manufacture, and in some few places the gravel bed was not observed at all, but this is very exceptional.

The gravel bed is, as a rule, pierced in well-sinking, and the minor forms of the gravel are usually visible round the mouth of the well, *if it is a new one*. The wells are of small diameter, three to four feet, and the gravel conglomerate, firmly cemented

¹ Here several flat oblong polished celts of diorite were obtained by me in the ravines, and two singularly sharp bevelled fragments of the cutting edges of polished celts, which were in all probability broken in use. I have constantly found such chips in Banda.

as it is with carbonate of lime, is not easily broken up with the rude tools at the command of the villagers. Whatever the cause I have only found two rude and doubtful fragments which bore evidences of human workmanship brought up in this way. They have since become mixed with the rest of the collection.

The first axe-head picked up was, strange to say, one of the most perfect found: a rapid search was rewarded by the discovery of a pile of specimens weighing over a hundred pounds, and as I was only accompanied by a single attendant I was obliged to make a selection of these, and leave the remainder behind. The next day I pitched my tent on the spot and began my inquiries.

From the large number of implements, and from various other considerations, I concluded that the spot where they were found had been the seat of a manufactory and that the implements had not been drift-borne from over extensive areas. Thus, the whole of the gravel stratum is not equally prolific of implements; indeed they are rare elsewhere. The spalls (*i.e.*, chips) struck in the manufacture of these implements, and the huge primary flakes from which they were manufactured are found here; and I consider that the bulk of my specimens (say 95 per cent.) are unfinished implements.

The implements show signs of rolling, and weathering, and occasionally bear deposits of carbonate of lime. They are very unequally worn, some having the edges sharp, others being much worn and rounded. When broken across on purpose, they show that the material has altered in colour to the depth of a tenth of an inch and often more. The amount of wear and weathering on the celts is the same as that exhibited by fragments of similar rocks in the shingle.

No trace of fossil animal remains was found in the immediate vicinity.

The celts were found *in situ*, both in exposed sections of the gravel and in sinking pits, where the superincumbent alluvium is from two to three feet thick.

The amount of concretionary deposit on celts naturally weathered out is less than on those won by digging.

All the rocks which occur in the Talchir boulder bed are represented in the collection.

No polished implements occurred mingled with the roughly chipped; nor any implements formed of feldspathic rocks, or of jade. Stone hammers occur in the proportion of about 3 per cent. Flakes are found, but they are very coarse, and possibly doubtful.

About 12 feet of alluvium occurs at various points, but on carefully examining it no implements were found. There are

no indications of celts or rude flakes in the Talchir boulder bed itself. In two or three cases there are chips on the broad ends of the lanceolate specimens which seem to have been caused by use, but as a rule the broad end is unfinished and often bears a piece of the crust of the original pebble. The pointed end, on the contrary, is nearly always finished.

It will now be necessary to give a description of the composition and nature of the gravel.

The gravel stratum varies from two and a-half feet in thickness to one foot in parts. This in the Hinouttee locality is composed of boulders, pebbles, subangular fragments, cubical fragments, masses of limestone, &c. The boulders vary from 18 inches in diameter to tiny pebbles an inch in diameter. The whole is loosely cemented into a mass by carbonate of lime. In places, as opposite Amaharee, the cementing matrix is exceedingly hard and difficult to dig into. Here the superincumbent alluvium is from twelve to fourteen feet thick, and the gravel stratum projects some ten feet into the river's bed in a bold promontory, having so far resisted the erosion of the river, and offering an exceptionally fine field for observation. The gravel here, as elsewhere, rests directly upon the Talchir boulder bed, the lower strata of the gravel actually touching it. The rocks which occur in the gravel are almost identical with those in the Talchir boulder bed, and I find I have noted them as parti-coloured jaspers, jasper-conglomerate boulders, pink gneiss, hornblende gneiss, porphyritic gneiss, tourmaline granite, lumps of epidote and epidotic granite, pegmatite, vein quartz, quartzites of all colours, cherts, and even graphitic schist.

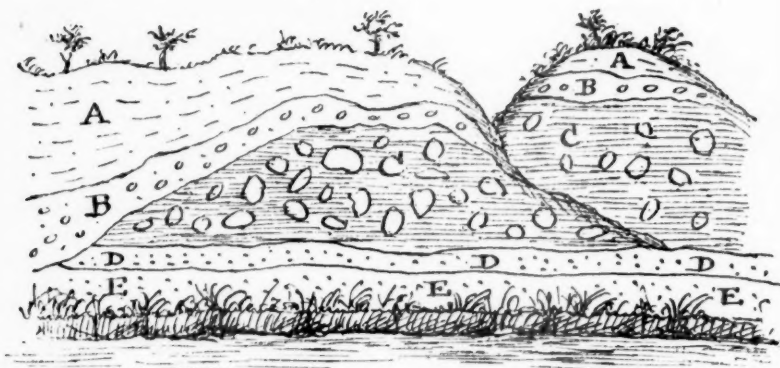
I cannot identify the quartzite with any existing upper Vendhian¹ quartzite beds with which I am acquainted in the country between Urgoorh Ghat and Burdhee. The first implement found *in situ* was a hundred yards lower down than the projecting bed. Here a magnificent section of the drift gravel is exposed for the distance of a quarter of a mile along the east bank, covered with alluvium from 10 to 14 feet thick.

The specimen, an unfinished hache, lay with a portion of the worked point projecting, firmly cemented in the hard mass. Its position was slightly below the middle of the mass, and it required to be chiseled out with a cold chisel and hammer. It is uniformly covered with a fine deposit of carbonate of lime, except on the projecting portion.

The following section will give some idea of the relations of the gravel bed, Talchir, and superincumbent alluvium. The

¹ The lower Vendhians seem everywhere to give way and disappear with far greater rapidity than the upper Vendhians. This is very noticeable in the Banda district.

Talchir beds are of very uneven thickness, and the dip rolling. For those who are not acquainted with Indian geology the following brief sketch of this characteristic formation is appended.



SECTION ON RIGHT BANK OF THE BALLIAH NADI, OPPOSITE HINOUTEE.

A. Alluvium. B. Gravel, containing the implements. C. Talchir boulder-beds. D. Red sandstone. E. Green sandstone.

The Talchirs form the base of the Gondwana series and rest on metamorphic gneissic rocks: their thickness has been estimated at from five to 900 feet, as a rule, and in the area described, notably, "they form thin, irregular beds, filling up hollows in the metamorphic rocks which latter are often exposed through the Talchirs by denudation" (Griesbach, *Mem. Geolog. Surv. Ind.*, Vol. xiv, p. 14, "Ramkola and Tatapani Coalfield"). The porphyritic gneiss of Pipra is the rock most commonly thus exposed.

The Talchir rocks consist of silty greenish or blackish shales, splitting into angular pieces (being jointed in three directions), or of tolerably compact green and red feldspathic sandstones, occasionally slightly gritty. The terms mudstones and needle shales admirably describe the appearance of the former. The boulder bed is usually green or black silty shale. In this indurated matrix occur pebbles and boulders of all sizes from an oval pebble one quarter of an inch in length to blocks 15 feet in diameter.

The Talchir boulder bed is now generally admitted to be of glacial origin, and is attributed to the close of the palæozoic epoch. It need hardly be said that no single fragment which bore the slightest resemblance to even the rudest implement

has yet been found in the boulder bed, though I have searched it in vain for many miles.

The Talchir boulder bed has been supposed to be of the same age as a very similar formation at the base of the coal-bearing rocks in South Africa. These rocks are described by Mr. Gooch in his paper on the stone age of South Africa ("Journ. Anthropol. Inst.," 1881, page 167), as "fine highly laminated shale with boulders included." It would appear from his geological diagram, that the quaternary alluvium and gravels which have yielded palæolithic implements in such abundance cap this boulder formation at more than one point, but I have not clearly made this out from the letterpress, and may be mistaken. As noted by Mr. Worthington Smith in the discussion that followed the reading of Mr. Gooch's paper, the palæolithic specimens of celts very closely resemble those from Madras, and I may add, the Singrauli gravels.

This brings me to Messrs. Foote and King's discovery of implements in the laterite of the North Arcot District, Madras.

Mr. Foote's discovery was made in 1865, and the results published in the "Madras Journal of Literature and Science," for October, 1866.

Most of his specimens were found in broken-up shingle, the *débris* of a laterite conglomerate composed of quartzite pebbles; but some appear to have been found embedded in solid laterite itself; this appears, likewise, to have contained pebbles.

The laterite conglomerate either rested on metamorphic gneissic rocks, or on rocks which belong to the Upper Gondwana system, the Sri Permatour shales. These shales are of possibly similar age to the Talchir sandstones, and the thickness, composition, and deposit of the laterite gravel is very similar to the Singrauli gravel, substituting lime as the cementing matrix in the place of laterite.

No laterite is found near Hinouttee, but it caps the Pats of Sirgoojah 30 miles south, and even occurs north of the Sone River, near Sookerit, 21 miles south of Chunar, on the Ganges.

I personally compared my specimens with such of Mr. Foote's as were exhibited in the Calcutta Exhibition of 1884, and the specimens are so very similar, that it would hardly be possible to separate them were they mixed together. Every type figured by him is represented in the collection made.

He supposes that the laterite conglomerates and sands were deposited at the bottom of a shallow sea studded with mountainous islands, between which flowed strong and rapid currents, and that the implements were either dropped by accident from rafts or boats, or accumulated by the upsetting of these craft.

He divides his implements into three classes:—

Class I. Implements with one blunt or truncated end ; II. Implements with a cutting edge all round ; III. Flakes.

Mr. William King, in an appendix to the above paper, was of opinion that certain of the sites were the seats of manufacture, and with this opinion I agree.

It still remains to account for the extensive spread of the gravel bed described by me over so large an area, and for the fact that many of the celts show traces of grinding and rounding of edges. It must, however, be remembered that the alluvium is very thin and that it is quite possible that if the existing brooks and streams flowed over the bare Talchir rocks and were proportionally larger, enormous quantities of shingle would rapidly form, from the weathering out of the Talchir pebbles. It is easy to understand how some of the implements would be submitted to greater rolling and grinding than others. The variation in this respect, as will seen from the specimens, is very considerable.

The arguments in favour of the site, Hinoutee, having been the seat of a manufactory are so strong as to outweigh any other consideration. The arguments in favour of the site having been a manufactory are :—

1st. The presence of the raw material which is identical with that of which the palæoliths are made.

2nd. The presence of recognizable stone hammers in the proportion of 3 per cent.

3rd. The presence of spalls, chips, and flakes.

4th. The fact that specimens in all stages of manufacture occur, and that the great majority are obviously unfinished products.

Neolithic manufactories quite as extensive have been observed by me near Kalnegar, Kalyanpur, &c., and are strewn with chert and agate splinters, used-up stone hammers and broken and unfinished implements.

My conclusion is that the implements lie where they were made, subsequent to their manufacture ; and that some 20 feet of alluvium thinly scattered with pebbles from one to two inches diameter was deposited over them by aqueous causes, including possible glacial action.

DISCUSSION.

Mr. C. H. READ observed that the implements found by Mr. Cockburn in Mirzapore formed a very interesting series, although he did not think there was among them any new Indian type. They strongly resemble, as the author observed, those found by Mr. Foote, and appear to be made of the same kind of stone. The great similarity that exists between the implements of the Drift gravels, whether in India or Europe, is a very curious point, and

one that does not seem capable of any satisfactory explanation. One of these implements in Mr. Cockburn's series might very well have been found in Suffolk, except that the material is not flint; in shape and colour it absolutely corresponds. Looking at the forms alone, and making some allowance for the difference of fracture between flint and other stones, nearly all the shapes seen here are found in the Drift of Europe. The discoidal implement with an edge all round might, perhaps, be called an exception, for, though this form does occur in England, it is of rarer occurrence.

Mr. J. ALLEN-BROWN remarked on the importance of such a collection as the author had brought before the Institute. As Mr. Read has observed, most of the implements are of well-known palæolithic forms, which have been found not only in the oldest river drift deposits of England, France, and Southern Europe, generally, but also in South Africa, in the Nile Valley, Asia Minor, and India, as well as in the Trenton gravels of North America, which are said to be of glacial origin. The quartzite implements, from the laterite deposits of Madras, closely resemble those in this collection from South Mirzapore, and like the former, it is extremely difficult to determine the age of the specimens. These implements appear to have been found mostly on the surface of the drift gravels and not in those deposits: under such circumstances we have no evidence of the fauna which existed at the time they were fabricated, and are, therefore, without one of the most trustworthy tests of antiquity.

Though form alone cannot afford evidence as to age which can safely be relied upon, the persistent occurrence of certain definite forms of roughly-hewn pointed implements and chopping tools (examples of which are in this collection), not only in the oldest river drift, but also in the most ancient deposits of bone caves with extinct quaternary mammalia is remarkable—such a similarity of form, however, may be explained by the assumption, that early man formed his implements naturally on the simplest models.

Some of these instruments are worn as if from use. There is no appearance of abrasion from contact with other stones in a stream, but the angles of fracture, and surfaces of some of them seem to be slightly altered, probably by rain which contains a small amount of carbonic acid, and which may have acted also as a solvent.

With regard to these objects being found near the surface, or upon the gravel deposits, Mr. Allen-Brown could well believe from the evidence which had been presented to him in the Thames Valley Drift, that old land surfaces afterwards covered by gravel and alluvium, may subsequently be exposed by denudation, and that, as a consequence, palæolithic implements may be found on the present surface of the land; though roughly chipped into shape, he regarded the specimens exhibited as finished implements, and it is probable that the spot at which they were found, was inhabited for a long period; there is not enough evidence, the speaker thought, of its having been a manufactory of such objects from the discovery, with them, of a few flakes.

The following Notes were read by the Assistant Secretary :—

NOTES on STONE IMPLEMENTS from PERAK.

By ABRAHAM HALE, Esq.

IN "Nature" of October 29th, 1885, I first drew attention to two stone axes which I had procured at Kinta, Perak. I have since been able to increase my collection by several other specimens, all procured from Malays. Most of them having been preserved in the houses of natives of this district for several generations, have been passed down from father to son as heirlooms of no inconsiderable value. At the present time the purpose which they serve is that of whetstones on which to sharpen razors for which they are admirably suited, being for the most part made from what appears to be a very close and fine grained stone, almost like greenstone.

Nearly all the specimens are apparently axes or tomahawks of different descriptions. Of these weapons or implements almost every type associated with the neolithic era seems to be here represented except those which have been bored to admit the haft or otherwise sculptured for the same purpose: of these, however, I have heard tidings here, and hope soon to procure specimens. With one exception which was found by a Sakai about three feet deep in made earth, which he was sluicing off to procure tin sand, I can give no history of the finding of any of these specimens, beyond the imperfectly recollected statement of the Malays, on which no very great dependence can be placed—every one of them being heirlooms.

I have questioned Malays concerning Sakaies and also Sakaies themselves concerning the matter: neither the one nor the other have ever heard of such a thing as these articles ever having had any other use beyond that of whetstones or lucky things to have about the house. Probably much light would be thrown on the matter if one or two of the numerous limestone-caves of this district could be scientifically explored. This task I hope to accomplish before very long myself. For my part I think it more than probable that the Sakaies of early times, say five hundred years ago, before intercourse with Malay traders was established to any extent, were the manufacturers. These specimens are now in the Perak Museum at Thaiping.

DISCUSSION.

Mr. READ pointed out the great interest of stone implements from a new or comparatively unknown locality, and although there were no absolutely new types among the drawings exhibited by Mr.

Hale, yet it was of importance to put on record the fact, that in the small State from which these specimens came, the type is the same as that of the neighbouring islands.

It is by no means surprising to find that there is some difficulty in inducing the native possessors of these ancient implements to part with them. Almost over the whole world these relics of the former inhabitants are regarded by the uncultivated classes as of some supernatural value, either as medicine, or from the idea that carrying them about the person will avert disaster or death. Even among the ancient Greeks, at the time when art was at its best, flint arrowpoints are found set in jewellery of the most perfect style and workmanship, and they can only have been so used in the belief that they carried with them some mysterious power. Dr. J. Anderson, in his excellent account of the expedition to Bhamo, mentions a similar belief among the Shans. Indeed, in our own country, and at the present day, instances are known of people of education entertaining the same superstitious belief in the virtues of stone implements.

MARCH 22ND, 1887.

FRANCIS GALTON, Esq., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors—

FOR THE LIBRARY.

From the Right Hon. the SECRETARY OF STATE FOR THE COLONIES.—

Despatch from the Acting Administrator of Gambia.

— Statistics of the Colony of New Zealand for the year 1885.

From the DIRECTOR OF THE UNITED STATES GEOLOGICAL SURVEY.—

Bulletin. Nos. 31-33.

From the AUTHOR.—History of the Sarsens. By Professor T. Rupert Jones, F.R.S.

— Syllabus of Twelve Lectures on the History of the British Empire. By Rev. Alfred Caldecott, M.A.

— Ethnographische Mittheilungen aus Venezuela. By Hr. A. Ernst.

— Per la priorit  di una sua determinazione di resti umani della caverna della Palmaria stali prima attribuiti ad un macacus. Di Ettore Regalia.

From the ROYAL ARCH OLOGICAL INSTITUTE.—Arch ological Journal, No. 172.

- From the ASSOCIATION.—Journal of the Royal Historical and Archæological Association of Ireland, No. 67.
 From the SOCIETY.—Proceedings of the Royal Society. No. 251.
 — Journal of the Society of Arts, Nos. 1790–91.
 — Proceedings of the American Philosophical Society, No. 124.
 — Proceedings of the Literary and Philosophical Society of Liverpool. Vol. xxxix, xl.
 — Bulletin de la Société de Borda, Dax. 1887. Part I.
 From the EDITOR.—Nature. Nos. 906–907.
 — Science. Nos. 213–214.
 — Photographic Times. No. 285.
 — Walford's Antiquarian, No. 63.

Sir ALLEN YOUNG, Sir L. MCCLINTOCK, Mr. SETON-KARR and Dr. JOHN RAE exhibited a large number of ethnological objects principally from Arctic America.

The Secretary read the following paper :—

*The MIGRATIONS of the ESKIMO INDICATED by their PROGRESS in
 COMPLETING the KAYAK IMPLEMENTS.*

By DR. H. RINK.¹ (Communicated by DR. ROBERT BROWN).

In a paper which I had the honour to present to the Institute last year, I tried to demonstrate how the dialects of the Eskimo tribes point to the interior of Alaska as the probable home and indicate the route by which they have spread over the coast regions from the Aleutian Islands to Labrador and Greenland.

The next question will be, how do the other peculiarities of the tribes agree with this conclusion? Notwithstanding the extreme simplicity and poverty of their mode of life, differences can be traced in their state of culture, caused partly by progress or new inventions, partly by certain habits being permitted to fall into decadence during their migrations. The problem is facilitated here by the fact that the Eskimo nation has been less exposed to that mixture and contact with other races which elsewhere renders the question more complicated. The changes have here more exclusively been dependent on natural influences, to which they were subjected in their new

¹ Besides the printed sources of information used in the preparation of the present article, I have been favoured by obtaining special communications from John Murdoch, A. Jakobsen, Aurel and Arthur Krause, relating to the West, Franz Boas regarding the Middle regions, and G. Holm concerning the extreme East of the Eskimo territory.

homes. For this reason the farther we go back towards their supposed mother country, the more of their original habits we must expect to find still preserved.

I shall try to apply the investigation here indicated to the chief Eskimo invention, the *kayak*, or skin canoe, and to the implements which belong to it. In Greenland the latter are known to consist of (1) The water-tight clothes which when in due connection with the kayak itself, entirely covers its occupant excepting his face. (2) The double-bladed paddle. (3) For ordinary use: the large harpoon connected by a line with the bladder, intended for retarding and weakening the seal in its course through the water. (4) The lance used to give it the *coup de grace* or mortal wounds. (5) For small seals: the "bladder-arrow," or small harpoon, with a bladder fixed to its shaft. (5) The "bird-arrow," or javelin, with long subsidiary hooks of bone on the middle of the shaft to strike the bird should the hunter have missed the mark with the primary point.

Beginning with the inland Eskimo of Alaska we find that he is still carrying on his fishery in the rivers by means of the birch-bark canoe just like his Indian neighbours, but in settling at the river mouth he has exchanged the birch bark for skin, at the same time protecting his small skiff against the waves of the sea by a deck. This of course may be simply the origin of the kayak; we find it subsequently improved with regard to its form and dimensions, but otherwise it remains the same.

The implements mentioned above appear gradually, as, after having left southern Alaska, we proceed towards the north and east. The first of them, the kayak dress, has been the latest to acquire perfection. At first the dress appears to be intended as much for protection against rain as against the sea. As far as I know they do not pass beyond this stage even in Labrador, and in Greenland not before they enable the kayaker to be quite independent of the dangers of capsizing or being wholly covered by heavy sea. Then, as for propelling the kayak, in southern Alaska, perhaps with exception of the Aleutians this is performed merely by the one-bladed paddle of the Indian canoe. The first proper double-bladed kayak paddles are met with north of the Yukon River, but even there the one-bladed paddle is still used on occasions, almost as frequently as the former, and as far as we are able to judge from models, this custom is still maintained at the Anderson River. At Point Barrow the one-bladed paddle always serves for common, the other only for particular use.

Then passing to the weapons, the bow and arrow of the Inlanders are even said to have been carried on the kayak in southern Alaska. While this, however, remains doubtful, it is

still a characteristic fact, that some at least of the javelins there are furnished with birds' feathers like the arrows for the land chase. But in the main it must have been already early observed, that a seal, even when hit by a harpoon will be able to escape more easily than a terrestrial animal, namely, by diving. To prevent this, a small inflated bladder was attached to the end of the harpoon, and in this way the "bladder-arrow" of the Greenlanders was invented. Only for sea-fowls this was found unnecessary, whereas the javelin for capturing them was fashioned as mentioned above.

The "bladder-arrow" is certainly met with on Kadjak Island. But by-and-by we see how it has been found necessary to enlarge the bladder, and of course at the same time the missile, by offering too much surface to the air, grew more and more unfit for being thrown to a suitable distance. In fact, specimens from Alaska are still seen of such a shape as would astonish a Greenlander. This inconvenience then gave rise to the invention of the large harpoon and the bladder to be separately thrown out, only connected with the harpoon by means of the long hunting line. This contrivance is unknown on Kadjak Island; passing to the north, loose bladders as a kayak implement are said to be met with for the first time just beyond the Peninsula of Aliaska, but only as a rarity, and even on Point Barrow the large loose bladder, like the double-bladed paddle, is only employed in exceptional cases, whereas the "bladder-arrow" suffices for ordinary use. I do not know where the more general use of the large harpoon and bladder begins; but in Greenland, in accordance with ancient custom, a boy is not considered a seal-catcher before he has captured his first seal in this way.

Now there is still one invention to be mentioned as indispensable in completing the large harpoon. This improvement also makes its appearance gradually from south to north, almost side by side with the loose bladder. Experience must early have shown the usefulness of fastening the point of the javelin on its shaft in such a manner, that after having hit the game it will be detached from the end of the shaft, and only remain fastened to it hanging by a strap. In Southern Alaska we see this tried in different ways, but further to the north, along Behring Strait, it is more perfectly performed. The use of the large harpoon especially required that the point should get wholly rid of the shaft, and the latter be allowed to remain floating separately; while the seal runs off with the line and the bladder. For this purpose the foremost part of the shaft is made with a joint, which enables it to be bent, whereupon the point and line will directly fall off. The movements of the seal in its struggle will occasion this. The same flexibility is given to the lance,

whereas, on the small harpoon, or "bladder-arrow," the point has been destined to remain fixed immovably to the shaft.

Finally, we have to consider that side by side with the improvements of the implements the kayak itself is rendered more suitable for its purpose by the necessary adjustment of its form and size. A peculiar construction, and especially a certain degree of narrowness of the kayak, was still required in order to enable the kayaker to rise to the surface again by means of his paddle, in case he was capsized. This art, which in Greenland also has been considered one of the indispensable accomplishments of a seal hunter, is, as far as I have been able to discover, only exceptionally known in other Eskimo countries. Moreover, it may be added as a curiosity in the history of the development of the kayak implements, that the extreme east of Greenland can still boast of one or two small improvements unknown on the west coast of the same country.

DISCUSSION.

Dr. JOHN RAE on being asked to address the meeting said, that anything either spoken or written by Dr. Rink, regarding the Eskimo, must demand the greatest respect and attention of everyone. Especially is this the case as regards the natives of Greenland, of whom Dr. Rink knows, from personal knowledge, more than any other man living, having made himself as far as possible, master of the subject.

As regards the Eskimo from Hudson's Bay, westward to Behring Strait, Dr. Rink's evidence is not of equally great value, depending as it does on the report of others, and not on his own observation. Dr. Rae entirely agrees with Dr. Rink's remarks on certain advantages of the Greenlanders' *kayak*, and the expertness of the kayaker himself, over those of the natives further west, where the *kayak* is much broader in the after part, therefore less liable to capsize, and could not be "righted" by the kayaker as the man of Greenland does when capsized. He had seen kayaks capsize both at the McKenzie River and in Hudson's Bay, and but for the presence of others the men would have been drowned. Along all the Arctic coast from McKenzie River to Hudson's Bay the double paddle is used, so also is the waterproof sealskin coat, tied round the wrists, the face, and round the rim at opening where the man sits.

The various parts of the kayak as mentioned by Dr. Rink, with the exception of one weapon, were well illustrated by a model of a Greenland one shown by Dr. Rae.

Dr. Rink said he had tried to demonstrate that the interior of Alaska was the probable home of the Eskimo tribe, and his *original* boat the birch bark canoe, which he still uses on the rivers of Alaska, "just like his Indian neighbours." Dr. Rae, with much diffidence ventured to differ entirely from this view, and his

opinions are on record in the journals of the Ethnological Society and Anthropological Institute; his belief being that the old home of the Eskimo tribe was the north-eastern portion of Asia, and that in their emigration to America they came from the west and crossed the sea, probably at Behring Strait.

Dr. Rae further thought that the original boat of the Eskimo was made of skin, and that when they went inland by the great rivers of Alaska and made a new home there, they, being an adaptive and clever people, naturally took to building and using bark canoes, as being more readily and easily made, and cheaper, as sealskins could not be obtained, except with difficulty. Dr. Rae considered that, under the circumstances, a change from skin kayak to bark canoe was no sign of degenerating, but rather shewed intelligence and ingenuity.

Mr. H. W. SETON-KARR observed that the model which Dr. Rae exhibited was the true *kayak* having only one hatch. The two models which the speaker exhibited were of three hatch *bidarkies*, as this kind of canoe is named in Central Southern Alaska. The sealskin canoe is not known further south than the Copper River. From this point west to the Aleutian Islands these *bidarkies* are one, two, and three hatch, rarely one hatch. Two and three hatch *bidarkies* were formerly confined exclusively to the Aleutian Islands. North of Bristol Bay only one hatch *bidarkies* are used. This is the *kayak* proper. Mr. Seton-Karr exhibited an Eskimo gut coat which he always wore himself, but he explained that he could not put it on as it was necessary always to wet these coats or *kamleygas* in order to soften them first. He understood that this word was from a Siberian word, *kamlaia* meaning "deer-skin coat." Wearing these coats in a *bidarky* or *kayak*, and having them firmly lashed to the rim of the hole, one can pass through rough water and even breaking surf in safety. Bows and arrows are certainly carried upon the canoe in Prince William Sound and Cook's Inlet. He exhibited some of the bows and arrows used for sea-otter hunting. The barb is fixed lightly in the end of the arrow and remains fixed in the sea otter while the shaft becomes detached. and the gut string unwinds. The shaft then floats at right angles to the cord, and, acting as a drag, soon exhausts the animal. The arrow is winged with eagle's feathers, and the fore part of the shaft is white bone from a whale's jaw.

Mr. Petroff (who was a census agent for enumerating some of the Indian tribes in South Alaska in 1878-1880, and who was sitting near Mr. Seton-Karr at supper when the Alaska Company's agent was shot at with slugs from outside the house and killed by his side by a Russian Indian) considers that the Eskimo reached the coast from the interior.

Sir ERASMUS OMMANNEY, remarked that in his arctic voyages he had visited the settlements in Greenland, Okkuk in Labrador; on his search after Franklin's expedition he communicated with the small tribe located on the coast at the extreme north of Baffin's

Bay and the entrance of Smith's Sound, lat. 78° N., from whom he brought to England he believed the only Eskimo ever brought to this country, the tribe in question being isolated entirely from the habitable world, even from the Eskimo in southern Greenland, from whom they were separated by hundreds of miles of glacier. This singular tribe were first discovered by Captain John Ross in 1818; until then they believed themselves to be the sole possessors of the earth; on beholding Ross's ship they were amazed and terrified with fright, wondering with awe what the apparition of the ship would entail upon them.

It was at Cape York that the speaker fell in with these people, and induced one of them to join the ship, with a view to make him useful in his search for Franklin; the youth was about eighteen years old; he came aboard with three companions. On being taken into the engine room the furnaces astonished them, but when the engine was started they bolted on deck with fright. Being anxious to proceed, as he had a wish to bid farewell to his friends, he went on to the Wolstenholme Sound where he ascertained that H.M.S. "North Star" had wintered there. The Eskimo was named Erasmus York; he conducted the speaker to the winter quarters of his tribe, which consisted of several huts built with stones into a dome shape. Several dead natives were found in their huts lying in their clothing of sealskin, and there was a place of sepulture for the dead. A spear was removed from a grave by one of the officers, which called forth tears and entreaties from the natives, as they hold a superstition that the spear is required after death for hunting in another world.

As regards the origin of these people, this native gave evidence of Asiatic descent: in form and features he was of Mongolian type, the eyes being placed in an angular line as in the Chinese, wide apart, high cheek bones, flattish nose, sallow complexion, straight black hair, wide across the forehead, about five feet four inches in height. From the traces of their settlements along the south shores of the Parry Islands, it must be concluded that these people had in former times gradually migrated from Behring's Straits.

It is remarkable that the habits, dress, and implements correspond with those of the Eskimo on the continent, Labrador, and South Greenland.

He passed the winter with the party after Sir Erasmus Ommanney had discovered the first traces ever found of Franklin's ships; the party was frozen up for eleven months, and during that time he became accustomed to our habits and learnt to read and write. On the speaker's return to England he was sent to the Missionary College of St. Augustine's College, Canterbury, for three years; the mind did not expand beyond the rudiments of the three R's. He was docile, amiable, taciturn, had naturally good manners, and was devoid of excitement. He showed a taste for drawing; and delineated a good map of the country and coast of his native land. The animals on which these people subsisted were seals, walrus,

deer, and birds. They did not possess the kayak, or canoe, in use by the other Eskimo.

Sir LEOPOLD MCCLINTOCK desired to express his admiration of the genius and the enthusiastic perseverance of the author of the paper, Dr. Rink, through whose labours our knowledge of the habits and traditions of the Greenland Eskimo has been so greatly increased.

He exhibited to the meeting some interesting woodcuts, being the work of these people in Greenland, illustrating their mode of life, their traditions, including their conflicts with the Scandinavians and their weapons. Dr. Rink, who had fostered these efforts at producing woodcuts, very justly appealed to them as evidence of the capacity of the Greenlanders for improvement and elevation.

Sir Leopold also exhibited a toy sledge, from the Eskimo living under the 78th parallel—and therefore nearer to the North Pole than any other people. It was composed, like their large sledges, of pieces of drift wood, bones, and walrus ivory, ingeniously bound together with strings of seal skin. He remarked that here in the north-west corner of Greenland, the further migration of the Eskimo was checked by impassible limits of ice and snow, and in this desperately severe climate, their privations were so great that their lives were spent in a constant struggle for subsistence; they were unable to supply themselves with kayaks, or bows and arrows. They were but few in number and they were decreasing yearly. In reply to the President he said he saw no greater difference between this remote tribe and other Eskimo further south along the shores of Baffin's Bay than was due to the greater severity of their climate and the greater privations they were subjected to.

Miss BUCKLAND requested some of the Arctic explorers to inform her whether bows made of bone were used by the Eskimo, as there were two in the Bath Museum among relics brought over by Ross or Parry, which she understood had been taken from Eskimo graves, and as one was broken, she wished to know whether it is the custom of these people to break weapons and other implements buried with the dead as is done by some races either with the idea of sending the spirit of the implement to join the spirit of the man, or with the more utilitarian idea of preventing its being abstracted and used by the living.

Professor FLOWER read extracts from two letters addressed to him by Mr. COUTTS TROTTER, dated from s.s. "Lübeck," between Samoa and Sydney, December 19th and 22nd, 1886.

NOTES on the NATIVES of the POLYNESIAN ISLANDS.

By COUTTS TROTTER, Esq.

RECOLLECTING the interest you have taken in the natives of these islands, and the study you have given to them, I cannot resist giving you one or two general impressions that struck me, not that they can be of the smallest value. I need hardly say how often I wished for your presence while puzzling over the different types of face that one sees. One curious thing is the way they all resolve themselves into a few groups, within each of which all the individuals are so closely alike, that it is all but impossible to distinguish them, so that you are constantly reduced to the alternative either of cutting your acquaintance or of saluting a stranger, and in these sociable regions the latter plan is much the less likely to give offence. This appearance of running into groups may be merely the way one's eye behaves among new surroundings, but I think the small numbers and isolation of the people, their tribal systems, and some of their customs, *e.g.*, the practice, for political or social reasons, of keeping up certain large circles of connection or cousinship, may have something to do with it. Then, besides the varieties in each island, you have the effects of intercourse between the groups. In the east of Fiji the Tongans have more than half swamped the Fijians, and one traces Fijian blood in Tonga, and also even in Samoa. In fact one of the characteristic Samoan types—a broad, rounded, good humoured face, with eyes slightly smaller than average, and in the women always ready to dimple into smiles—always seemed to me to have something Fijian in it, though after all, this is perhaps only an element common to the three groups, for this pleasant rounded female face, which at last you begin to think quite pretty, has a sort of counterpart, *with a difference*, in Tonga, where perhaps it is rather prettier. Another different, and equally characteristic, type of Samoan man has peculiarly clean straight cut eyes and brows, giving a rather cold, hard, *distingué* expression. By the way, are all these people mesorrhine? My eyes may have deceived me, or become used to the type, but I should say many of the faces one sees have the lower part of the nose no wider than a European.

Of course you meet plenty of men and women without either fine figures or handsome faces, but a large proportion have fine figures and carry themselves well, and there is a smaller but relatively considerable number of men perfectly magnificent in size and proportion from head to foot, never falling away below the knee like some of the otherwise fine Indian races, and many

of the young women have perfect busts and figures that seem to tread on air.

The women carry themselves even better than the men, who often slouch a little, and it is remarkable that the old women do not become hags, but the figure remains perfectly slim and upright, and very elegant. The way they are trained to walk has something to do with this, the shoulders square, and the head thrown back, the arms at every step (this especially in Tonga) swung well behind them. But in Tonga the beauty of the human figure is seen no more, for the ex-reverend Premier, whether for moral or financial reasons I leave you to judge, has decreed and strictly enforces a heavy fine on every man who is seen, even inside his fence, without a shirt, and on any woman not muffled in a pinafore. The rule does not anyhow tend to cleanliness, and it also makes it less easy than formerly to compare the colour of Samoans and Tongans: To my eye there is distinctly a shade more of yellow in the former, a slight excess of copper, in short, in the Samoan bronze. The upper class is by no means fairer than the lower (probably the two are much mixed), anyhow I saw conspicuous examples of the contrary. The Tongan royal family, for instance, the Tubo, is exceptionally dark, as is the family of Thakombau in Fiji (I forget in which of the Polynesian groups they have a saying to the effect that the chief is dark and the common man fair).

Of Fiji I saw very little beyond parts of Viti Levu, but there too, mingling with the usual broad-faced, dark brown type, I constantly detected another, with an elliptical-shaped face, high and narrow forehead, projecting brows, skin rather black than brown, altogether a more negroid look, but this type again, or modifications of it, is not confined to the Kai-si (common people). By the way—language apart—wherever we may be pleased to class the typical Fijian, he is to the ordinary observer distinctly much nearer to the Samoan and Tongan than he is to the Solomon or New Hebrides man, and he is a far finer looking fellow than these Melanesians. I have not seen many New Hebrides people, but I have seen numbers of the Solomons, and was much struck by their diminutive size; very small heads, but clean, lithe, active little fellows. But as regards the Fijian you cannot help feeling that however "interesting," he has not the mental capacity of either Tongan or Samoan, though (as has been noticed before), his artistic powers seem greater or more developed. But what struck me as especially curious was the occurrence both in Samoa and Tonga, but especially in the latter, of very marked "Mongolian" or Japanese features. I recall particularly a granddaughter of the King of Tonga, with a small slight figure,

dark, but sallow, small features, distinctly oblique eyes, and long, black hair, drawn up off the forehead into a top knot, who might have walked off a Japanese fan or plate. I suppose these are only the result of accidental importation? In the Tokelaus (Ellice group) many of whom one meets as imported labour, the Mongoloid look is also very strong. Several of their women I saw, if appropriately dressed, would be undistinguishable from North American squaws.

I regret — among many regrets — that I could not go to Rotumah. The Rotumah boys, whom one constantly meets as sailors, are the handsomest Pacific islanders I have seen; but in an island of this size, which has been frequented by whalers for generations past, there must be a large infusion of European blood, a circumstance which, I take it, modifies the type in many of the groups to a greater extent than is commonly allowed for. I am ashamed at having gone on gossiping to this length, and will say nothing about the charming manners and refined nature of the people—for everyone has noticed this. Such a contrast in real innate politeness to the Arabs for instance, who are supposed to be a polite people, and their houses so infinitely cleaner and pleasanter. Perhaps after all, their cricket and their music are the most wonderful things about them, showing their extraordinary powers of adaptation—you see these men, naked from the waist upwards, and bare legged, standing up to swift bowling, fielding splendidly, wicket keeping, going “over,” just like so many born Britishers; and the way they have taken up European music, when well taught, as by Mr. Moulton in Tonga, is equally remarkable, especially when one remembers how essentially different it is from their own. I enjoyed their own proper music, and it grows strongly on you. There is a great deal of melody, the most perfect and intricate time, and distinct harmony, but there is something essentially different from our music, and often I heard songs which I do not think could be rendered by our system of notation.

Once more excuse the length to which I have run on. I wish I could have sent you anything of real value, but to have done this would require, besides the previous training and technical knowledge which I do not possess, a far longer residence in the islands, and a knowledge of the language.

I have heard two or three times of stone implements being dug up at considerable depths in the Fiji Islands, and in one case the implements were quarried out of a reef, which argues long habitation. I enclose a sketch of a celt, dug up some two feet deep in the Rewa River, and another of a curious sort of gouge. I believe these last have been found elsewhere, but I have not heard of them in Fiji. The material of the gouge

appeared to be a fine grained basalt. Dr. Macgregor, to whom they belong, showed me a large and very thick, heavy celt, also of basalt, and much worn, which was found at nine or ten feet depth in alluvium.

ANTHROPOLOGICAL MISCELLANEA.

LECTURES ON ANTHROPOLOGY.

A course of three lectures on "Heredity and Nurture" will, with the permission of the Lords of the Committee of Council on Education, be given at the South Kensington Museum, on behalf of the Anthropological Institute, by Mr. Francis Galton, F.R.S., President of the Institute.

The Lectures will take place on Saturday afternoons, November 12, 19, and 26, at 4.30 p.m.:—Lecture 1. November 12th. Observed diversity in the bodily and mental characteristics of individuals. Anthropometric tests, and records of life-histories. Lecture 2. November 19th. Limits to the inheritance of ancestral peculiarities, and to the hereditary transmission of disease. Individual variation. Lecture 3. November 26th. Influences of various kinds of nurture, training, and occupation on the average vigour, longevity, and disposition, of large classes of persons. Recapitulation and suggestions.

Demonstrations of anthropometric methods will be given at the close of each lecture, so far as time permits.

Students in Training, National Scholars, and registered Students of the Department of Science and Art will be admitted free. The Public will be admitted on payment of a registration fee of 1s. for the course.

BRITISH ASSOCIATION MEETING.

The fifty-seventh Meeting of the British Association for the Advancement of Science will be held at Manchester under the Presidency of Sir Henry Roscoe, M.P., LL.D., D.C.L., F.R.S., commencing on Wednesday, August 31st. Section H, devoted to Anthropology, will be presided over by the Rev. Professor A. H. Sayce, M.A. Papers to be read at this meeting should be sent as early as possible, with Abstracts, to the offices of the Association 22, Albemarle-street, or to Mr. G. W. Bloxam, Recorder of Section H, at the rooms of the Anthropological Institute, 3, Hanover-square, W. It is proposed to form a museum of objects of anthropological interest to be open during the week of meeting. Persons desirous of contributing to this museum should give due notice to the Recorder.

ARCHÆOLOGICAL MEETING.

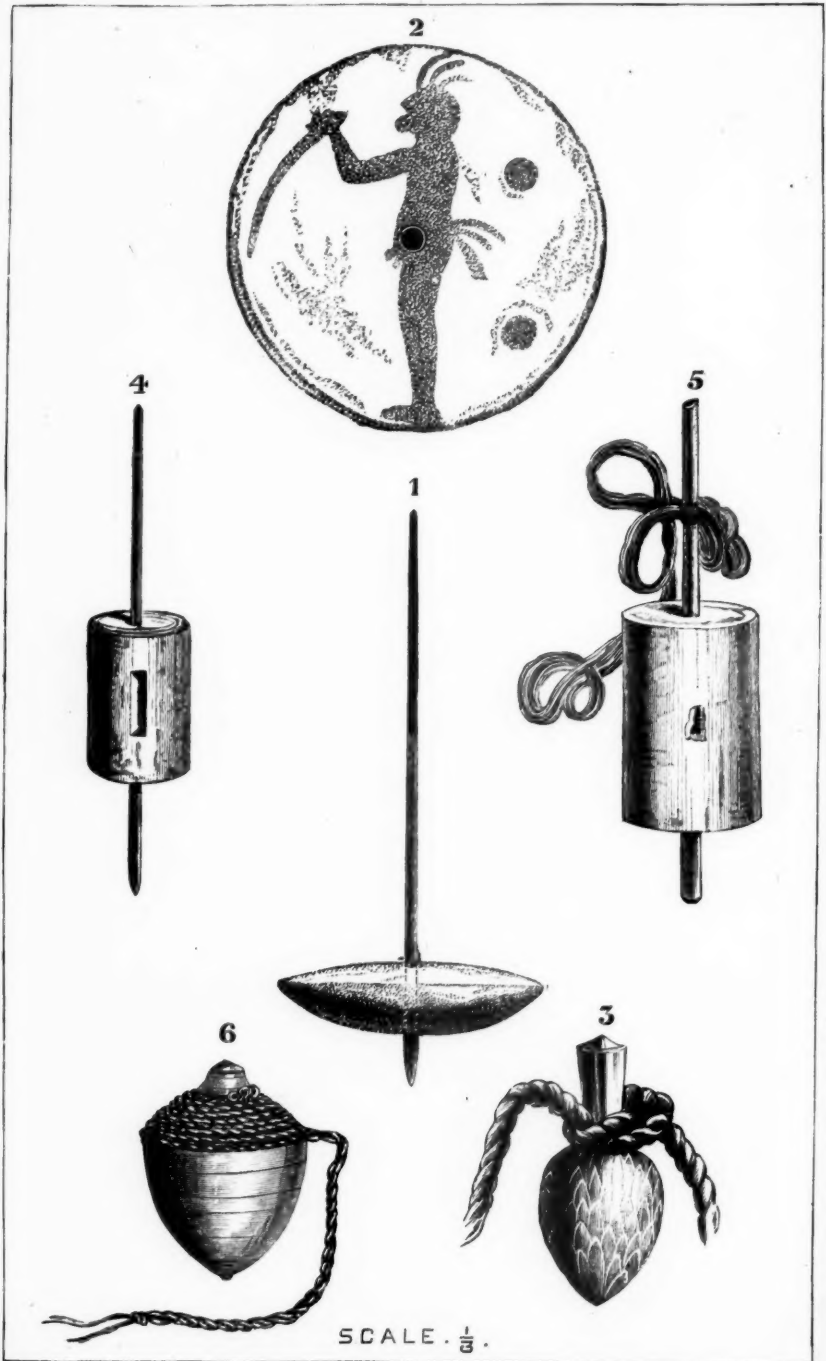
The Annual Meeting of the Royal Archæological Institute of Great Britain will be held at Salisbury, under the Presidency of Lieutenant-General Pitt-Rivers, D.C.L., F.R.S., F.S.A., commencing on Tuesday, August 2nd, when the President will deliver the inaugural address.

The Romano-British villages, described by General Pitt-Rivers at the last meeting of the Anthropological Institute will be visited on August 9th.

At the conclusion of the Salisbury meeting a party will proceed to Brittany for the purpose of studying the prehistoric monuments and other objects of archæological interest. It is proposed to visit Cherbourg, Contances, Mt. St. Michel, Rennes, Vannes, Carnac, Quimper, &c.

CHINESE SUPERSTITION.

"On rapporte d'après des témoignages sérieux que les pirates chinois qui ont assassiné récemment M. Haitce, membre de la mission de délimitation du Tonkin, à Monkay, ont mangé son cœur et son foie et bu son fiel délayé dans de l'eau-de-vie de riz. Ils croyaient faire passer ainsi le courage du jeune Français dans leur corps. Ce fait indique une superstition que l'on retrouve dans presque toutes les religions."—From the "*Matériaux pour l'histoire naturelle et primitive de l'homme*," July, 1887, p. 300.



SPINNING TOPS. See page 89.